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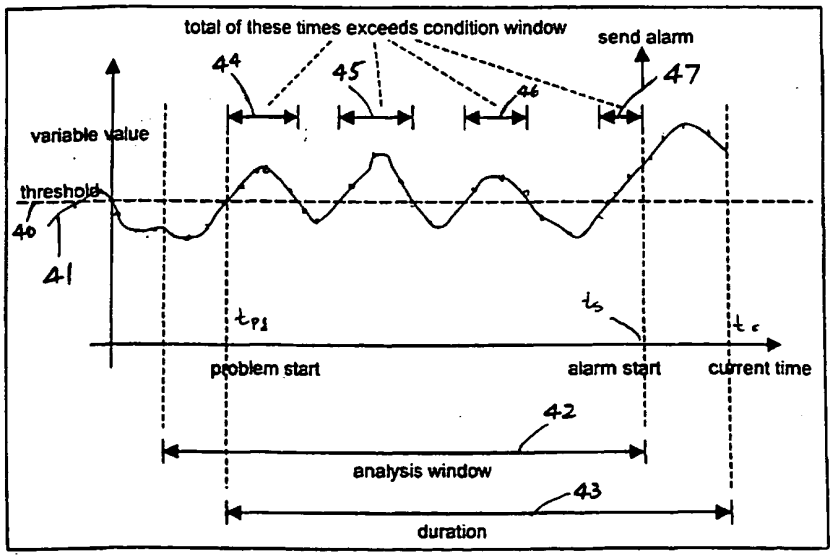

(57) Abstract: A method of monitoring an element in a computer network including monitoring a preselected variable (41) relating to that element; defining a threshold (40) for the monitored preselected variable (41); establishing a sliding window in time (42); repeatedly generating a time above threshold value (40), the time above threshold value (40) being a measure of an amount of time during which the monitored variable (41) exceeded the threshold (40) during the sliding window of time (42); detecting when the time above threshold value exceeds (40) a condition window value; and in response to detecting when the time above threshold value (40) exceeds the condition windown, generating an alarm.

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LIVEEXCEPTION SYSTEM

TECHNICAL FIELD

This invention relates to network monitoring, and more particularly to a system for identifying problems on a network, e.g. a large, widely distributed network.

BACKGROUND

In general, network elements include computing and storage devices, communication devices, software residing on these devices, etc. Examples are computes, disk storages, routers, switches, LANs, WANs, servers, and application software. Each element typically has a number of characteristics, or management variables, indicating its operating status. The management variables of an element are generally monitored so that problems occurring in the element can be detected and resolved. One approach for monitoring the elements is by polling. That is, a poller periodically gathers current status from the element being monitored. The gathered data is then sent to a processing unit that determines whether a problem has occurred in the element, and if so, a notification is generated.

Every network element provides a protocol for the poller to read and write its management variables. These variables are usually defined by vendors of the elements, and are usually referred to as a Management Information Base (MIB). There are some standard MIB's, such as the IETF (Internet Engineering Task Force), MIB I and MIB II. Through the reading and writing of MIB variables, software in other computers can manage or control the element. The software in other computers is usually called an agent. Thus, a network manager who is charged with the responsibility of locating and resolving network problems usually uses MIBs variables and agents to gather information from the elements.

Unfortunately, there is not a uniform MIB that can be used to manage a network consisting of elements supported by different vendors. Every MIB from every vendor uses a different set of messages to announce a network event, e.g. a fault. In general, these messages use a widely adopted messages format, known as a Simple Network Management Protocol (SNMP) trap. A network manager generally has to manually configure every element to generate SNMP traps properly. Even after traps are properly generated, there is rarely consistency in what each represents across different types of elements.

In addition, the amount of data that is retrieved by the pollers can be overwhelming in volume. This volume of data can present a serious problem to the network administrator who needs to decipher the true significance of all of the information.

SUMMARY

At least in part, the invention is embodied in a LiveExceptions system, referred to herein as simply "LiveExceptions," which is a network management system designed to provide notifications of potential problems within networks, systems, and applications. Problems like high latency, unusual workload or failures often require the immediate attention of a network manager. However, it is sometimes very difficult to provide a timely and reliable notification, or alarm, when a problem occurs. The problem may go undetected due to lack of information regarding the problem source, or the alarm associated with the problem may go unnoticed due to the presence of too many other false alarms. LiveExceptions increases the accuracy of alarm generation by utilizing a comprehensive storage of historical data for every element in the network being monitored. With the historical data, LiveExceptions is able to adapt to the behavior of the element as time progresses, and to generate an alarm only when the behavior deviates from its norm. In some situations, an element's behavior is dependent upon the time of a day, and the day of a week, LiveExceptions takes advantage of this time-and-day dependence and further optimizes its adaptivity, thus increasing the overall accuracy of the alarm generation.

In general, in one aspect the invention features a method of monitoring an element in a computer network. The method includes monitoring a preselected variable relating to that element; defining a threshold for the monitored preselected variable; establishing a sliding window in time; repeatedly generating a time above threshold value; detecting when the time above threshold value exceeds a condition window value; and in response to detecting when the time above threshold value exceeds the condition window, generating an alarm. In this case, the time above threshold value is a measure of an amount of time during which the monitored variable exceeded the threshold during the sliding window of time.

Preferred embodiments include one or more of the following features. The method also includes after generating an alarm, maintaining the alarm at least as long as the time above threshold value exceeds a clear window value. The clear window value is equal to the condition

window value. The method also includes monitoring a plurality of variables relating to the element; and for each of the plurality of monitored variables, defining a corresponding threshold for that other variable, wherein the time above threshold value is a measure of an amount of time during which any one or more of the monitored variables exceeded its corresponding threshold during the corresponding sliding window of time. The step of defining the threshold for the preselected variable involves computing an average value for the preseleted variable based on values obtained for the preselected variable over a corresponding prior period; defining an excursion amount; and setting the threshold equal to a sum of the average value plus the excursion amount. The corresponding period of time is less than a day, e.g. a particular hour period of a day. The step of computing the average involves computing a mean value for the preselected variable using values obtained for that preselected variable for the same hour period of the same day of the week for a predetermined number of previous weeks. The step of defining an excursion amount involves computing a standard deviation for the preselected variable based on values obtained for the preselected variable over a predetermined period of time; and setting the excursion amount equal to K times the computed standard deviation, wherein K is a positive number. The step of computing the standard deviation involves computing the standard deviation using values obtained for that preselected variable for the same hour period of the same day of the week for a predetermined number of previous weeks. The step of defining the threshold for the preselected variable involves defining an excursion amount; and setting the threshold equal to H less the excursion amount, where H is a positive number. The step of defining an excursion amount involves computing a standard deviation for the preselected variable based on values obtained for the preselected variable over a predetermined period of time; and setting the excursion amount equal to K times the computed standard deviation, wherein K is a positive number.

In general, in another aspect, the invention features another method of monitoring an element in a computer network. The method involves defining for that element a profile that includes a plurality of different alarm rules, each of which establishes an alarm test for a corresponding one or more variables. It also involves detecting when the alarm test for any one or more of the plurality of different alarm rules is met; repeatedly generating a time above threshold value that is a measure of an amount of time during which any one or more of the alarm tests has been met during a preselected prior window of time; detecting when the time

above threshold value exceeds a condition window value; and in response to detecting when the time above threshold value exceeds the condition window, generating an alarm.

In some preferred embodiments, the method also involves, after generating an exception, maintaining that exception at least as long as the time above threshold value exceeds a clear window value.

In general, in still another aspect, the invention features a method of displaying on a computer display screen historical performance of an element on a network. The method includes monitoring performance of the element; for each of the plurality of time slots, deriving a measure of performance for the element from its monitored performance; for each of a plurality of time slots, computing an average value for the measure of performance of the element; and, for each of the plurality of time slots, computing a variability for the measure of performance; on the computer display screen and for each of the plurality of time slots: (1) displaying a first indicator of the computed average value for that time slot; (2) a second indicator of the computed variability for that time slot; and (3) a third indicator of the derived measure of performance for that time slot.

In general, in another aspect, the inventions features programs which implement the functionality described above.

The details of one or more embodiments of the invention are set forth in the accompanying drawings and the description below. Other features, objects, and advantages of the invention will be apparent from the description and drawings, and from the claims.

DESCRIPTION OF DRAWINGS

Fig. 1 is a block diagram of the LiveExceptions problem detecting and reporting system.

Fig. 2 is an example of a MIB Transformation File (MTF) that is stored in the poller module.

Fig. 3 illustrates the relationships among alarm rules, profiles, groups, group lists and exceptions.

Fig. 4 illustrates the determination of the severity of the alarm.

Fig. 5 illustrates the time over threshold algorithm.

Fig. 6 illustrates the dynamic time over threshold algorithm.

Fig. 7 is an example of a browser screen for displaying the network performance information to the user.

Fig. 8 is an example of an alarm detail report.

Fig. 9 shows a computer system on which the LiveExceptions can be implemented.

Like reference symbols in the various drawings indicate like elements.

DETAILED DESCRIPTION

The LiveExceptions System: A General Description of its Components

The overall structure of the LiveExceptions problem detecting and reporting system 10 is shown in FIG. 1. System 10 has a poller module 110 that gathers data from MIB variables of elements in a data source 160 (e.g. a network). The data from each of the MIB variables is then transformed into intermediate data by poller module 110 and stored in a database module 120 for trend report generation. Database module 120 includes a data storage unit 121, which stores the intermediate data; and a baseline calculation unit 122, which converts some of the intermediate data into variables meaningful to a user, computes statistics of the variables, and sends the computed statistics back to data storage unit 121. Whether statistics are computed depends on rules stored in a LiveExceptions Engine (LE Engine) 100.

A transformation function implemented in poller module 110 normalizes the raw data received from the network. The normalized data represents a more condensed form of the data than the original raw data received from the polling. On each poll, poller module 110 sends the normalized data to LE Engine 100, which in turn retrieves the computed statistics from data module 120 when appropriate.

The statistical calculations that are required by some of the rules generally, but not always, involve computing statistics such as the 1^{st} and 2^{nd} moments. The rules in LE Engine 100 specify the particular variables of interest for which such statistics are to be computed. Since the computed statistics usually sufficiently characterize the relevant variables of interest, using the computed statistics, instead of the raw data or the normalized data, tends to increase the accuracy in problem detection in a wide variety of situations. In addition, the statistics take up much less storage space than do the normalized data from which they are derived.

In the described embodiment, poller module 110 typically polls the MIBs from which it retrieves as often as once every 5 minutes and it stores and maintains six weeks worth of the polled data. Of course, the polling frequency and the period for which data is collected can vary widely depending upon the requirements of the network manager. In any case, considering the large number of variables that would typically be monitored, the volume of data, even when stored in the condensed form, can take up a significant amount of storage space.

The LE Engine

LE Engine 100 receives normalized data from poller module 110, and statistics from database module 120. LE engine 100 computes values for the monitored variables from the normalized data. The computed variables are defined in label tables stored in LE Engine 100. It then compares those computed values to statistics that were computed for those variable according to particular rules which apply, and determines if a problem has occurred in the element from which the polled data was retrieved. If the comparison indicates the existence of a problem, LE Engine 100 generates an alarm or a number of alarms, each of which indicates a problem relating to the monitored network elements. After a problem is detected and an alarm is generated, that alarm is sent to an exception data store 150 and also to a Network Management System (NMS) 170 in the form of a SNMP trap. System 10 further includes a web server, which receives the alarm from exception data store 150 and forwards it to an event viewer 130. Event viewer 130, which is a GUI browser, displays the alarm in a Network Operation Center (NOC) 135 and on various network manager workstations so that the problem can be quickly identified and responded to by a network manager.

Configuring the LE Engine

LE Engine 100 is the core processing unit of system 10. For LE Engine 100 to operate according to desired rules for selected elements, a number of items and parameters need to be defined for it, such as elements, variables, alarm rules, and length of observation time. These items and parameters are defined in configuration files stored in LE Engine 100. System 10 has a set of predefined configuration files that are suitable for various situations. But it also allows a user to customize the configuration files to satisfy particular user needs.

Configuration change

A user makes configuration changes through an administration interface 190 or a configuration module 180, or the user can import a file containing required configuration changes. Upon receiving the changes, LE Engine 100 updates the states of its internal data structures to reflect the changes while continuing its normal operations. After the changes are implemented in the configuration files, LE engine switches to the new items and parameters without having to re-start or re-compile.

In the described embodiment, Engine 100, poller module 110, database module 120, exception data store 150, web server 140 and configuration module 180 are housed in a single unit or compartment.

Variable Evaluation

If there is a problem with an element in the network, the problem is detected by evaluating variables associated with that element. The evaluation is based on a number of factors, which generally include polled data gathered by poller module 110, historical information from database module 120, and a number of pre-defined rules. Each of these factors will be discussed as follows.

Two-stage Transformation -- The MTF

Poller module 110 polls MIB variables at a pre-defined rate, e.g. every 5 minutes, by using their Object IDs (OIDs). Each of the OIDs points to a unique MIB variable. The polled MIB variables are then combined so as to remove redundant information. The pre-defined normalized forms and the transformations between the normalized forms and MIB variables are defined in a MIB Transformation File (MTF) 111 stored in poller module 110. MTF's are used in connection with the commercially available Network Health product sold by Concord Communications, Inc. and documentation generally describing MTF's is provided for that product.

The MTF data types

MTF 111 is used to transform a MIB variable into a normalized form. A number of normalized forms are pre-defined for each element type, for example, Ethernet, Token Ring, WAN, Frame Relay, Asynchronous Transfer Module (ATM), remote access devices, routers,

servers, etc. The normalized form has two data types: counters and gauges. A counter is a non-negative integer which monotonically increases until it reaches a maximum value, after which it wraps around and starts increasing again from zero. Examples of a counter generally include number of bits, number of seconds in latency, or number of frames. A gauge is a non-negative integer which may increase or decrease, and examples of a gauge generally include percentage of bandwidth utilization, collision percentage and percentage of bad polls.

The MTF format

Referring to Fig. 2, an MTF 111 is an ASCII text file defining a transformation for a MIB that needs to be translated. MTF 111 includes three main sections: a support information section 21, a data source information section 22, and a translation information section 23. Support information section 21 includes a file name for the MIB being translated by this MTF, a MTF version number, and parameters that indicate whether an element defined in the file name is polled, how it is polled, and how it is reported. Data source information 22 provides information concerning response elements. It indicates the type of data that poller module 110 collects as well as configuration parameters and protocols used by the element. Translation information section 23 contains a number of expressions, or equations, that map MIB variables to normalized forms.

Extensible feature

An appealing feature of MTF 111 is its extensibility. As described before, a network system usually includes elements from different vendors, each defining and organizing its proprietary MIB variables in a proprietary way. By using the normalized forms defined in an MTF 111, a user is able to integrate standard and proprietary MIB variables into the same format for analysis and reporting.

When an element from a new vendor needs to be integrated into the existing network, a user simply writes an MTF 111 utilizing default or customized normalized forms to define the transformations for the MIB variables associated with the element.

Efficient Storage

A single normalized form is usually used by MTF 111 to convert many MIB variables. Typically, the number of normalized forms is less than thirty for each element type, i.e., a

number that is typically far less than the number of the different MIB variables poller module 110 handles.

The following example illustrates the concept of using normalized forms to achieve reduced storage requirements. Five MIB variables, MV1, MV2, MV3, MV4 and MV5 are mapped to three normalized forms NF1, NF2 and NF3. The five variables are computed as a combination of the three normalized forms. Because the three normalized forms contain sufficient information to produce the five variables, it is therefore only necessary to store NF1, NF2 and NF3 in the database and the transformations, i.e. Eq. 1 to Eq.5, in MTF 111.

$$MV1 = NF1 + NF2 \quad \text{(Eq. 1)}$$

$$MV2 = NF2 + NF3 \quad \text{(Eq. 2)}$$

$$MV3 = 2*NF1 - NF2 \quad \text{(Eq. 3)}$$

$$MV4 = 3*NF1 + NF3 \quad \text{(Eq. 4)}$$

$$MV5 = NF1/NF3 \quad \text{(Eq. 5)}$$

Two Stage Transformation -- The Label Tables

Referring again to Fig. 1, when historical information is needed, LE Engine 100 retrieves it from database module 120. The retrieved information is normalized data, and LE Engine 100 further translates it into a variable more meaningful to the user. The variable is assigned a unique label, and a row in one of a set of the label tables 102(1-n), referred to herein generally as label tables 102. The variable in label table 102 represents a characteristic of an element that is typically more meaningful to users than MIB variables. For example, variables in the label table 102 might include bandwidth, percentage of utilization, number of errors, bits_in, bits_out, just to name a few. Label tables 102 in LE Engine 100 store the conversions between normalized forms and these variables. The same label tables 102 are also stored in database module 120 and are used by baseline calculation unit 122 to also compute needed statistics.

In short, the variable that a user sees displayed in NOC 135 has typically undergone a two-stage transformation: it was transformed from a MIB variable to normalized data, and then from normalized data to the variable. A simple example illustrating the value of performing such transformations is as follows. In the MIB, the agent stores "good frames received" and "bad frames received". MTF 111 normalizes those to "frames received" as a count by summing the two counts. Label table 102(1) then takes "frames received" and divides by a delta time to obtain the "frames in rate" measured in frames/sec. Another label table 102(2) takes "bytes received"

and divides by "frames received" to derive the "average frame size". Thus, similar to the concept of reusing the normalized form in MTF 111, a single normalized form is usually used by label tables to compute multiple different variables.

The various label tables that have been defined for LiveExceptions are presented in Appendix A attached hereto.

One advantage of using label tables is that they make adding or deleting variables in reports much easier. When a user makes a new variable available to reports, he only needs to add a new label in the one of the label tables for that variable and this avoids having to modify other modules in the system. Similarly, a variable can be deleted by only having to modify a label table and not other modules.

Exception Generation

After LE Engine 100 receives the polled data from poller module 110 and converts it into a variable by a transformation defined in a corresponding one of the label tables, LE Engine 100 applies a rule to the variable to determine if a problem associated with that variable has occurred. If the problem has occurred, LE Engine 100 sends a notification to inform network managers. The notification is in the forms of a SNMP trap and an alarm. Alarms can be consolidated to signify a problem associated with a number of related elements. These alarms form an alarm set, which is call an exception.

The detection of a problem is specified in the LiveExceptions system via the alarm rule. Alarm rules are of two types, namely a simple alarm rule and a compound alarm rule. The simple alarm rule describes a condition which must be satisfied by a single variable defined on a single element. The user may specify:

- The element type
- Selection of an alarm based on variable, reachability or availability
- A variable (*e.g.*, BandwidthUtilization or TotalErrors)
- An analysis window
- A condition window
- Whether to watch for time over threshold, time under threshold, or unusual value above, below, or outside (above or below) the mean.
- An alarm severity: normal, warning, minor, major, critical

Each of these is described more fully below in connection with two examples of specific alarm rule types.

The compound alarm rule is a conjunction of two or more simple alarm rules. Users may select this conjunction via a GUI which is provided in the system. A compound alarm rule allows the specification of a different variable and thresholding condition on the same element.

Conjunctive rules implement an "and" of two sets of simple rule conditions. At each poll of the data variables, both variables of the two rules must meet their defined threshold conditions in order to add to the accumulated condition window time. For example, if the compound rule specifies a 5 minute out of 60 minute time condition, then if at a poll both variables are above their thresholds, 5 minutes will be added to the accumulated alarm time. If only one of the variables is above its threshold, no time will be added.

To make the alarm rules useful, they are applied to the data generated by an element. It would be very cumbersome for the user to specify each desired alarm rule to be applied to each desired element, so the system provides for alarm rule profiles. A profile 320 is applied to a group 330 or a group list 30 of elements. Profile 320 is typically defined for some specific technology and use. For example, a profile can be defined for a group of elements that form a backbone ATM WAN link. Every profile is populated with rules that detect problems associated with a specific use.

System 10 provides a number of predefined profiles that are applicable to a wide variety of element groups found in industry. Administrators can also define profiles that describe the criteria by which they want to manage their network. The kinds of profiles and problems each profile detects generally include:

- Delay profiles, which raise an alarm when an element is contributing to delay, either by being over utilized, or if we detect congestion.
- Failure profiles, which raise an alarm when an element in the associated group is down. They also raise an alarm if the relevant element is suffering too many errors and thus has effectively failed, or if it is in danger of failing, e.g. it is running out of some key resource.
- Unusual workload profiles, which raise an alarm if the workload presented to an element, or the work done by an element is unusual when compared against a historical time period.
- Host latency profiles, which raise an alarm if the latency to a host is unusually high, or beyond any reasonable limit.

Response profiles, which raise an alarm if response time problems are detected. Each profile is described in a separate table, with an entry in the table for each alarm rule (or set of closely related rules).

In addition to a set of predefined profiles which are provided with the system and which are applicable to a wide variety of situations found in industry, users can also create their own profiles. A list of profiles that are supported in the described embodiment are presented in Appendix B, attached hereto.

In general, a profile is typically defined for some specific technology and use, such as backbone ATM WAN links. Each profile is typically populated with rules which detect conditions appropriate to this use. Exceptions are tied to elements and profiles to distinguish the status of an element with respect to these uses. Each such exception/profile pair is displayed as a separate row entry in the LiveExceptions browser. For example, suppose a frame relay link endpoint element is defined, Acme-NY-Boston-link-5. Further, suppose we are measuring the latency from this endpoint to its far end, and that we are also measuring the dropped frames from this endpoint. Rules which define conditions on these variables exist in two profiles, FrameRelayLinkLatency and FrameRelayLinkDroppedFrames. Each of these profiles has different consequences for SLA issues, and each will show exceptions separately:

Element	Severity	Description	Profile
Acme-NY-Boston-link-5	Critical	Dropped Frames Exceeds 2%	FrameRelayLinkDroppedFrames
Acme-NY-Boston-link-5	Major	Latency Above 100 msec	FrameRelayLinkLatency

In the above example, the increase in dropped frames is more likely to lead to a user's inability to utilize agreed-upon bandwidth. A high latency, while an important indicator of performance, does not necessarily lead to the loss of throughput which would violate an SLA. Were these exceptions combined as an overall element status (without regard to profile), this distinction would not be readily apparent.

A profile is applied to a group of elements or a group list via a Subjects-to-Monitor dialog in the LiveExceptions Browser. This has the effect of applying each rule in the profile to each element in the group which matches the element type of the rule.

Groups and group lists are known concepts in the field of network monitoring. In general, a group is a list of elements that might have some feature or technology in common, e.g.

they might be a set of elements of a similar technology (e.g. disks). A group might also be some combination of elements for which a network manager would want to learn similar types of information. A group list is a collection of groups that might have a more general relationship to each other, e.g. different storage device types.

Once profiles and groups are associated with each other, the LiveExceptions system begins to monitor the flow of polled data from the specified elements and generates alarms accordingly.

Referring to Fig. 3 visually depicts the relationship among alarm rules, profiles, groups and group lists. LiveExceptions includes a family of algorithms 300 for detecting problems. Algorithms 300 are implemented in LE Engine 100 as background processes that monitor the data collected by poller module 110. Algorithms 300 are invoked by alarm rules 310 that are written in a profile 320. A profile can be applied to a group or a group list. In Fig. 3, profile 320 is applied to a group list 30, which includes a number of groups 330(1-n). Each group usually represents a specific use, while group list 30 usually represents a more general use. Profile 320, together with the associated groups 330 group list 30, instruct LE Engine 100 on which elements to monitor, and when to raise alarms. Alarm rule 310 is defined on a problem detection algorithm 300, and in addition, it also contains a set of parameters 320 that control the algorithm, such as thresholds, analysis windows (i.e. baseline periods), and condition windows, etc.

Fig. 3 also depicts a compound alarm rule. In the illustrated example, alarm rule 310A is AND'ed with alarm rule 310B to form a compound alarm rule 310F. This compound rule raises an alarm only when all simple alarm rules in the compound rule calls for an alarm to be raised.

An exception 340 combines all the alarms generated within profile 320 and produces a single output at a given time. When exception 340 occurs, LE Engine 100 sends a trap to NMS 170, and also causes it to be displayed on event viewer 130. An alarm has a number of severity levels, each level is defined in terms of the amount that a value deviates from its normal value. The severity of an exception is the maximum severity of all individual alarms defined within the corresponding profile.

An exception combines the states of one or more alarms defined on an element. The severity state of an exception is the maximum severity of all the alarms currently active on an element, within a given profile. When no alarms are active on an element, the first alarm to be raised generates an exception. Thereafter, subsequent alarms raised and cleared simply change

the severity of the exception. When the last alarm constituting an exception clears, the exception itself is said to be cleared.

Referring to Fig. 4, two alarms a1 and a2 are defined on an element. a1 is a minor alarm, and a2 is critical. The following events ensue:

- When a1 is raised, an exception is generated with severity minor.
- When a2 is raised, the exception is updated to severity critical.
- When a1 clears, the exception severity remains critical.
- When a2 clears, the exception is cleared.

Alarm Rule Algorithms

Time Over Threshold

One key approach to detecting problems involves using the history of the monitored data. A particularly simple way of doing this is illustrated by the time over threshold rule, the operation of which can be more easily understood by referring to Fig. 5. In general, as LiveExceptions accumulates polled data for a particular varable, LE engine 100 looks at that data over an interval of time, referred to as an analysis window 42, which in the described embodiment is typically an hour though it could be longer or shorter depending upon the circumstances and performance needs. LE engine 100 compares the data values in this interval with a predefined threshold 40, and computes the total time that the value is over the threshold. In the illustrated example, the accumulated time is the sum of intervals 44, 45, 46 and 47. If this total time is greater than a predefined amount, referred to as a condition window, LE engine 100 raises an alarm and sends out a trap to the NMS.

The wall time at which an alarm is raised is the alarm start time, t_s. The wall time at which the data value initially crossed the threshold that subsequently led to the alarm is the problem start time, t_{p1}. The time from the problem start time to the current wall time is the duration 43 of the alarm. Through its browser interface located in the event reviewer, LiveExceptions displays each of these times to the user.

When an alarm is raised, it is said to be active. Analysis continues using the same parameters which induced the raising of the alarm. The alarm continues in an active state until its conditions are no longer satisfied, at which time the alarm is cleared, thus becoming inactive.

As time progresses, as long as the total time over threshold 40 in analysis window 43 still exceeds the condition window, the alarm remains active but no further traps are sent to NMS. LE Engine 100 clears the alarm when the accumulated time over threshold 40 in analysis window 43 no longer exceeds the condition window. When the accumulated time no longer exceeds the condition window, LE Engine 100 sends another trap to the NMS notifying it that the alarm condition is now cleared.

It is important to note that the analysis window 42 continues to slide along the time axis after an alarm becomes active, continuing to watch for time over threshold conditions as time advances. This means that the alarm will not clear capriciously, reducing the probability of "flapping" alarms – those which continually assert themselves even though a troublesome condition has been posted and is well known by operators.

While simple, the time over threshold rule is very powerful. Transient problems – brief spikes in the data – do not raise an alarm. However, recurring spikes do raise an alarm. This draws an important distinction between quick spikes which would be mere annoyances should they trip an alarm, and a series of such spikes which should demand attention. In addition, continuous time spent over the threshold also raises an alarm, indicating a persistent condition that should be corrected.

As indicated previously, at least the following parameters are settable by the user through the interface or by other means:

- ***Threshold*** - which is the data value above which time is accumulated.
- ***Analysis Window*** - which is the time interval within which time is accumulated.
- ***Condition Window*** - which is the total time required to be spent by the data value above the threshold which causes an alarm to be raised.

In addition, LiveExceptions enables a user to select, through different rules, variations on the time over threshold theme, as will be discussed below.

Note that the actual monitored data is in the form of a series of individual data points, with a data point for each polled period. However, for visual effectiveness, the user interface displays these not as individual data points but rather as a line graph interconnecting the individual points.

Time Over Threshold for Availability and Reachability

The basic time over threshold rule is modified to determine the reachability or availability of an element.

Availability and reachability are important special cases in the LiveExceptions rule definitions. Reachability is defined as the ability of the poller to communicate with the device containing an element. To be reachable, a device must respond to ICMP pings. An indicator of whether a device is reachable is generated by the poller for use by the LiveExceptions system on each poll of the device.

Availabilty is more complex. Its definition is time-dependent. The poller assesses properties of the device such as reboots (via sysUpTime), and ifOperStatus (or equivalent), when defined by the device. Availability is generally not known by the poller until it successfully polls the device, so an immediate value is not always obtainable on each poll.

The availability algorithm detects when an element is unavailable. LiveExceptions clears the alarm once it becomes apparent from the polled data that the element has been up for at least the length of the window defined in the alarm rule. In this case, the purpose of the window is to raise a single alarm when an element is "bouncing" up and down repeatedly.

For hosts, routers, switches, servers, and remote access servers (RAS), when the host goes down, it will not be possible to ping or poll the host's agent. This will be seen as a Reachability problem first. Later, when the host reboots and comes back up, it will be possible to ping and poll the host's agent again. At that point, LiveExceptions will see that the host has rebooted, and was down, and will raise an alarm at that time.

When the child elements within LAN and WAN interfaces, modems, ISDN, CPUs, disks, partitions, processes, process sets, and response paths hosts, go down, the host's agent may remain up and can be pinged and polled. In those cases, LiveExceptions can detect that the child has gone down when it polls the element, and will raise an alarm immediately.

Reachability is defined by whether or not an element can be pinged, i.e. if a query can reach an object and its response can be received. Availability is determined by whether or not an element is functioning, i.e. it is up or down. A non-reachable element will generate an alarm at the moment when poller module 110 is unable to reach it, but the alarm is cleared only after the element becomes reachable again for the amount time specified by the analysis window. Availability works in the same way.

The reachability algorithm detects when a ping of an element's agent IP address fails.

For hosts, when the host goes down, the agent address stops responding to pings and a reachability alarm is immediately raised for the host. The normal sequence of events when a host goes down is:

1. The host goes down.

2. The host's agent IP address is pinged, the ping times out and the ping is retired. When all the tries time out, the ping fails and a **Host Unreachable** alarm is raised.

3. Eventually, the host reboots and comes back online.

4. The host's agent IP address is pinged and the ping succeeds. The host' agent is then polled and it is learned that the host rebooted, and that the host was unavailable for some time. A **Host Down** alarm is raised at that point.

5. If pinging of the host's agent IP address succeeds for a continuous time equal to the window defined in the rule, the reachability alarm is cleared.

Most child elements within a host, have the same agent IP address as their host parent. An IP address is only pinged once, and the results of that ping are used for all the elements with the same address. All the children have the same reachability as their parents. The default profiles therefore do not define reachability alarm rules for children. Instead these are limited to parent hosts.

This modified rule is simpler than the basic time over threshold rule because it does not require a threshold. When an element or an application is down, it immediately generates an alarm. Furthermore, in a real system, it is common for an element or an application to go through cycles of ups and downs. The modified rule, like the basic rule, is able to consolidate the problematic behavior and reports it to NMS 170 in one trap

Time Over Dynamic Threshold (i.e. Unusual Value Rule or Dynamic Rule)

The simple time over threshold rule uses a constant threshold value. A time-varying threshold – one that depends on historical data – is also used in a number of other rules. One such variation defined by LiveExceptions utilizes the "normal" value for a variable at a given time of day.

Over a period of time, a series of data values will possess a distribution among the values presented. A distribution is normally summarized by its mean and standard deviation, concepts

derived from the normal or "bell curve" type of distribution commonly found in many kinds of statistical measurements. The statistical standard deviation is a particularly useful indication of deviation from a normal value. The mean is simply the average value over the set. The standard deviation measures the average "width" of the deviation of the values from the mean. It is a measure of the likelihood that a particular series of values will "veer off" from its current trajectory. Sometimes, users wish to know when a value plus its standard deviation are above some threshold, i.e., when the value is getting "too close to the edge." This is the idea behind the time over dynamic threshold rule or unusual value rule.

LiveExceptions stores a normal (or baseline) value for each hour of the day, computed as the average value for that hour over the preceding six weeks. In the case of the time over dynamic threshold rule, LiveExceptions compares the current data value to the normal value. Alarms are defined on the normal value and indicate that a certain amount of time was spent beyond a given deviation from the normal value.

This is expressed in LiveExceptions as a percentile. The percentile of a set of values with respect to a given value is the percentage of the number of values in the set which are below the given value. For example, we might say that "50 is the 90^{th} percentile value", meaning that 90% of the values in a set are below 50. This is an accurate statement of real multiples of standard deviation as well.

In other variations of this rule type, LiveExceptions also allows the user to specify deviations by an ordinary percentage and by an absolute value.

Detecting an "unusual" value of a variable is illustrated in FIG. 2. The main difference between this type of rule and the time-over-threshold rule previously described is that the threshold varies with time. However, note also that contribution to the time over threshold in this case is not simply that the data value exceeds the threshold but it must exceed that threshold by the specified deviation as well.

Fig. 6 illustrates graphically how the dynamic time over threshold rule works. The dynamic time over threshold algorithm includes a normal value 51, i.e. a dynamic threshold value, an analysis window 52 and a condition window (a pre-defined fixed value, not shown). Normal value 50 is the value a data series cannot deviate by more than a certain amount, analysis window 52 is a sliding interval of time, and the condition window is a time threshold for the accumulated time during which the variable exceeds the mean by the predetermined amount (e.g.

the sum of time intervals 54, 55, 56 and 57). The alarm generation process is similar to that used for the time over threshold rule illustrated in Fig. 5. One major difference between this rule and the time over threshold rule is that threshold 40 is replaced by a time-varying normal value plus a "deviation."

The time over dynamic threshold rule was initially developed to provide a good indication of potential disk space exhaustion. Since running out of disk space is possibly catastrophic, the user should be warned if there is a high probability that this space will be used up soon. This rule accomplishes precisely this, since the standard deviation is a good measure of how widely space usage is likely to swing over some time period. The user-defined threshold in this case is 100%. The default LiveExceptions profiles encode disk space rules using the time over dynamic threshold rule.

However, the time over dynamic threshold rule may be useful in any situation where exceeding some hard limit would have catastrophic results, or would in some manner ruin your whole day. Examples of such variables might be memory usage, bandwidth utilization for SLA, or utilization of a set of dial-in lines.

When defined on the appropriate variables, unusual value alarms provide an excellent indicator of possible system problems. For example, a high traffic rate on a router interface late at night may indicate a runaway program attempting to communicate with a remote server. Or, a high CPU utilization on a normally little-used workstation could inform operators of a change in use or of an inappropriate program running on the machine. In either of these cases, remedial action or an increase in capacity may be called for.

There are two ways to look at this rule. One is to reduce a user-defined threshold by the standard deviation, and use the result as the actual threshold with which to compare the data value. Since the standard deviation is computed dynamically from the data, this gives rise to the "dynamic threshold" term in the rule's name. The idea can be summarized by the following simple formula for determining when a value is over the threshold:

$$\text{DataValue} > \text{UserThreshold} - \text{StandardDeviation}$$

Another way to look at this rule is by the "too close to the edge" analogy. Rearranging the formula slightly provides this viewpoint:

$$\text{DataValue} + \text{StandardDeviation} > \text{UserThreshold}$$

Note that this rule differs from simply defining a reduced threshold in that the reduced threshold is computed automatically, keeping track of day-to-day swings in usage of the variable. There is thus no need for the user continually to adjust the threshold to the desired level of sensitivity.

Absolute from Mean Rules

Using an absolute from mean detects when a variable is above or below the mean by a pre-defined fixed amount. This rule is most useful for detecting when a value has changed from a fixed or a stable configuration. For example, it can be used to detect when a file system has been reconfigured and its capacity has been changed.

Percentage from Mean Rules

Using a percentage from mean detects when a value is above the mean by a percentage. For example, a 100% above the mean rule detects when the variable is twice its mean value. This rule is useful for detecting changes in a value, in proportion to the average value.

Deviation from Mean Rules

Using a deviation from mean detects when the variable is above the mean by a dynamic percentile. The percentile is computed dynamically based on the standard deviation. A user can specify a percentile parameter in the rule to indicate how far a value can deviate from its mean to stay within the normal range. The higher the percentile, the further from the mean the value must be to raise an alarm. Deviation from mean dynamically determines both the mean and the acceptable variations of the data. It adapts to cases where the mean changes but the variable stays very closely to the mean (i.e. a small standard deviation), and also to cases when the mean remains the same, but the variation from the mean is wide.

Algorithms can be combined. For example, the deviation from mean algorithm can be combined with the percentage from mean algorithm to prevent small divergences from normal from generating alarms.

Time Over Dynamic Threshold with Time of Day and Day of Week

Analysis window 52 for the dynamic threshold rule need not be constant in time. In fact, for a wide variety of network elements, the statistics of the associated variables tends to vary,

depending on the time of a day, and the day of a week. For example, an Ethernet element in an office building typically has a higher usage during office hours in a weekday than an early morning hour on Sunday, and accordingly the percentage of packet collision fluctuates in the same way.

Therefore, the polled data for certain variables are grouped by the time, typically the hour, and the day in which they are collected. The statistics of the variables for that hour are computed and later combined to form the statistics for the entire analysis window.

Time Over Dynamic Threshold: Entire Time Range

A continuous time period can be used for detecting problems in some situations, for example, a potential disk space exhaustion. Since running out of disk space is catastrophic to a system, the user should be warned if there is a high probability that the disk space will be used up soon. In general, the basic time over threshold rule does not work in this situation because each disk partition has a unique threshold. However, the dynamic rule provides a good indication of how widely spaced usage is likely to swing over a certain time period.

Example: Disk partitioning

The time over dynamic threshold algorithm determines when a partition is nearly full by examining recent history of the associated variables over an analysis window of the past few weeks. The algorithm determines how much the partition utilization typically grows and shrinks over that period. It computes the variation seen in a variable over the entire analysis window. For disk partition problems, the variation is typically measured by its standard deviation.

Instead of using a specific time of the day and a specific day of a week, the statistics uses the entire time period in the analysis window. It is because the disk partition is generally not as sensitive to the time and day as other network elements. The dynamic rule is able to dynamically adjust itself to partitions with different characteristics, such as a rapid-changing partition space, a constantly full partition, or a partition with high but stable utilization, e.g. a system partition.

Historical Information at System Start-up

When system 10 starts up, LE Engine 100 is initialized and the basic time over threshold rule is used. Historical information is not used until after sufficient of data is collected to support

the rule. Similarly, when a user changes profiles, new elements are initialized without historical analysis.

Data Statistics Stored in Database Module

If a rules defined for variables depend on their statistics (e.g. dynamic rules), baseline calculation unit 122 converts the associated normalized data into the appropriate variables and computes the 1st and 2nd moments of those variables. The computation is performed incrementally instead of by fully recomputing the statistics each time an update is required, and the results are stored in data storage unit 121 for LE Engine 100 to use as parameters of the rules.

There are at least two benefits of using an incremental computation method. One benefit is that it saves disk space. Moments are more compact than normalized data and yet they sufficiently characterize the data, at least from the perspective of what the rules require. Another benefit is related to the computation cost. The computation of the 1st and 2nd moments over the entire baseline period, i.e. the analysis window, consumes large amounts of time and processing power. The incremental computation uses much less of both and stores intermediate statistical results that can be reused.

Incremental Computation of First and Second Moments

In the deviation from normal algorithms, LiveExceptions uses an incremental computation of the mean and standard deviation of a variable over a baseline period. The process works as follows.

The mean, $\bar{x}$, and standard deviation, σ_x, of a variable, $x(t)$ over time can be computed for a time period (T_0, T_1) using the formulas:

$$\bar{x} = \frac{\int_{T_0}^{T_1} x(t)\,dt}{(T_1 - T_0)}$$

$$\overline{x^2} = \frac{\int_{T_0}^{T_1} x^2(t)\,dt}{(T_1 - T_0)}$$

$$\sigma_x = \sqrt{\left(\overline{x^2}\right) - \left(\bar{x}\right)^2}$$

The variables collected are constant over a poll period. This is because many variables are rates, computed by polling the values of a counter at the start and end of a poll period, and computing the difference in the counter divided by the difference in time. This rate is the value of the variable over the entire poll period. While the polls are done at roughly even intervals, the intervals will vary in length slightly, and on occasion, a sample may cover multiple poll periods. For example, if a sample cannot be taken for two polls in a row, the actual sample collected on the successful third poll will cover 3 normal poll periods.

For any given hour, the samples may not (and are unlikely to) align with the start and end of that hour. So let the interval (T_0, T_1) demarcate the beginning and end of the hour. Also let $x_1, x_2, \ldots, x_n$ be the values of the n samples of the variable $x(t)$ taken at times $t_0 < t_1 < \ldots < t_n$ that cover the hour. I.e.,

$t_0 < T_0 \le t_1$
$t_{n-1} < T_1 \le t_n$

For all t such that $t_0 < t \le t_n$
$x(t) = x_i$, if $t_{i-1} < t \le t_i$

Then the system computes the following variables for the hour:

$$X_1 = \int_{T_0}^{T_1} x(t)\,dt = x_1(t_1 - T_0) + \sum_{i=2}^{n-1} x_i(t_i - t_{i-1}) + x_n(T_1 - t_{n-1})$$

$$X_2 = \int_{T_0}^{T_1} x^2(t)\,dt = x_1^2(t_1 - T_0) + \sum_{i=2}^{n-1} x_i^2(t_i - t_{i-1}) + x_n^2(T_1 - t_{n-1})$$

$$\Delta T = (T_1 - T_0)$$

This computation for each hour is done by a background process that computes and stores X_1, X_2, ΔT and T_1 to represent the statistics of the variable.

From these records, the mean and standard deviation of $x(t)$ for that hour are then computed as follows:

$$\bar{x} = X_1/\Delta T$$

$$\overline{x^2} = X_2/\Delta T$$

$$\sigma_x = \sqrt{\left(\overline{x^2}\right) - \left(\bar{x}\right)^2}$$

For Deviation from Normal using Deviation from Mean, the normal range is computed based on the mean and standard deviation of the random variable $x(t)$ for the k week baseline period for an hour. The baseline period consists of same hour of the day for the same day of the week for the previous k weeks. For example, a 6-week baseline for the hour from 1500 to 1600 on Wednesday, June 14, consists of 6 hours, all from 1500 to 1600 hours on Wednesday, June 7, Wednesday, May 31, May 24, May 17, May 10, and May 3.

The mean and standard deviation for the k-week baseline are easily computed given the stored hour records as follows:

$$\bar{x} = \sum_{j=1}^{k} X_{j1}/\Delta T_j$$

$$\overline{x^2} = \sum_{j=1}^{k} X_{j2}/\Delta T_j$$

$$\sigma_x = \sqrt{\left(\overline{x^2}\right) - \left(\bar{x}\right)^2}$$

Where $j = 1..k$ is the record index for the previous k weeks, i.e., record j represents the same hour of the same day of the week from j weeks ago. The records contain the values $X_{j1}, X_{j2}, \Delta T_j$, and T_j.

While each record is computed once by the background process, it is used k times in the following weeks. Note also that the record for the hour consists of just 4 variables, rather than a record per sample (a typical number of sample records in an hour is 12). Hence, a significant reduction in processing power and storage is achieved.

Statistics Updating and Retrieval

There are a number of considerations regarding how often the statistics are updated, and how the statistics are retrieved. For one thing, the statistics need to be updated frequently enough so that the relevant rules can adapt to the behavior of the variables and detect changes in those variables promptly. In addition, since the number of statistical results stored in the database module 120 is quite large, it is also important to retrieve them from the data storage efficiently.

Hourly Updating

According to one approach, baseline calculation unit 121 computes the hourly statistics for a variable. If the element associated with the variable is polled every 5 minutes, then there will be 12 samples for every hour. These 12 samples are sent to baseline calculation unit 121 for computing statistics and the results of those computations are stored in data storage unit 121.

When an element transitions into a new hour, LE Engine 100 queries database module 120 for the statistics for the variables associated with that element that are uses in a time over dynamic threshold rule. Depending on the type of the dynamic rule, the retrieval scheme differs as described in the following paragraphs.

Entire Multi-week Range

The retrieval scheme differs depending on whether the rule is based on an entire multi-week range or the rule is based on a specific hour of the day, and a specific day of the week (e.g. Tuesday at 9 pm) over a multi-week range. With respect to the rule based on an entire multi-week range, LE Engine 100 initially queries the database module 120 over the entire multi-week

range. That is, LE Engine 100 keeps N intermediate statistics for a variable, where "N" is the number of weeks in the entire multi-week range. As the element crosses into the next hour, data collected in the past hour is incorporated to the statistics while data from the hour in the beginning of the range is removed. Therefore, in a steady state, the database module 120 executes two queries for each hour crossed. One query is to add the new statistics for the hour just passed, the other query is to remove the old statistics for the hour at the beginning of the time range.

Time of Day and Day of Week

With respect to the rule based on a specific hour of the day and a specific day of the week over a multi-week range, the number of data transfers required is equal to the number of weeks in the multi-week range. When an element crosses into a new hour, LE Engine 100 sends N queries to database module 120 for the statistics of the data collected in the hour and day corresponding to the new hour, where "N" represents the number of weeks in the multi-week range. Therefore, in a steady state, N queries are generated each hour, each of the queries corresponding to statistics computed from the 12 data samples collected in a specific hour of the day and a specific day of a week in the multi-week range.

Nightly Updating

An alternative for updating the statistics throughout the day is for baseline calculation unit 122 to do all the required computations at the end of a day. In that case, baseline calculation unit 122 receives a job batch at night, processes all of the data contained in the job, and returns the results to data storage unit 121 afterwards. Then LE Engine 100 retrieves the calculation results when new statistics are needed. This alternative is especially suitable for the rule based on a specific hour of the day and a specific day of the week over a multi-week range, because new statistics are not needed until that hour and day arrives in the next week. This alternative also works for the rule based on an entire multi-week range with a modification that the update frequency being daily, instead of hourly.

Statistics Storage

The time over dynamic threshold rule requires that the moments be computed and stored for every variable associated with the rule. After baseline calculation unit 122 computes the

moments for every hour, it stores those statistics in data storage unit 121 using a row for every variable of every element being monitored. If there are multiple requests for monitoring the same variable of an element, only one row is generated for every hour. Therefore, the storage scheme is efficient in that it avoids duplications.

The Output – The Event Viewer

The output of LE Engine 100 is displayed in a Java-based GUI browser, the Exception Event Viewer. From the event viewer, a user in NOC 135 is able to choose to view an exceptions chart and exception counts for any group or group list, monitor the severity of the exceptions, and examine how the exceptions develop in time.

Referring to Fig 6, an exception event viewer 130 displays an exception event chart 61, an exception event table 62 and an organization frame 63 for communicating information to the network manager. Through exception chart 61, the system shows the total number of active exceptions for all elements in a selected group, or by default displays all the elements exception count. Through exception event table 62, the system lists all current exceptions. And through organization frame 63, the system allows a user to view all group lists, groups and elements and give an overall summary data view. Each of the display components can be easily resized, collapsed or expanded so that a user can focus on a particular display component.

Exception Event Chart

Through exception event chart 61, a user can view historical exception events and current exceptions events at the same time. LiveExceptions uses event chart 61 to display the total exception counts on the vertical axis for each polling period versus time, which is displayed as polling intervals on the horizontal axis in a scrollable panel. If a user has not selected a group or a group list from organization frame 63, event chart 61 displays all the groups total exception count as a default. If the user selects a group or a group list from organization frame 63, it will display all the current active exceptions for the selected group or group list. Also event chart 61 displays the name of the group selected, otherwise a default name "All" is shown. An exception chart viewing window range is configurable with the granularity of per polling period.

Exception Event Table

Exception event table 62 presents information in columns and rows. The columns have the following headers: Group list name, group name, element name, type of alert, start time of alert, end time of alert, severity of alert, technology type and key variables that triggered exception for this element from the list. Event table allows a user to select a column header to sort the element list in a scrollable panel. The user has the flexibility in arranging the orders of table columns via selecting the header and dragging and dropping to a user preferred column position, as well as configuring the columns to be viewed or hidden by using the right mouse button menu select options. The cleared, i.e. inactive, exceptions in the event table will be aged out from the event table, if they stayed inactive for a period time longer than a configured valued. Also, if a user switches from one group or group list selection to another, any aged inactive exceptions are removed from the event table.

Organization Frame

Organization frame 63 provides mechanism by which a user can quickly see where the exceptions occur and can to drilldown to the exceptions to access further information that is collected by the system. In organization frame 63 each group has a total number of exceptions occurring in that group. The exception event group list frame gives organization view of all the groups and allows a user to expand the group list and to groups and to elements, or to collapse a group of elements into a group and a group list in a scrollable frame. If a user selects a group from organization frame 63, event chart 61 displays the current exception counts in the event chart and the event table displays the appropriate data attributes. The groups or group lists are accessible only to the users who are associated with the groups and group lists.

Top 10 Exceptions Window

The Java-based event viewer 130 allows a user to click from an icon to popup a separate dialog window to display the top 10 exceptions with group or group list names and the total exception counts for each group or group list. The display of top 10 exceptions is automatically updated for a configured time period, and the last update time is also displayed. This popup dialog window allows to drilldown to another event viewer by clicking on the group or group list name.

Popup Menu Options

In addition, Java-based event viewer 130 allows a user to click on the right mouse button from organization frame 63 to launch a new event viewer such that the user can display and examine another set of elements or groups at the same time.

Alarm Detail Report

LiveExceptions can generate for the user an historical report of alarms or exceptions and display that report in event viewer 130. LiveExceptions enables the user to generate an alarm detail report, and then select an alarm or an exception for which the report is to be generated. The displayed trend report is a two-dimensional chart, the x-axis indicating the time, and the y-axis indicating the value of the monitored variable.

An example of an alarm detail report 70 for a particular variable is shown in Fig. 7. Report 70 plots the value of the relevant variable as a function of time (see plot 73). It also displays a sequence of vertical bars 72, each one representing a different 1-hour period of time and each one having a center line 71 marking the mean value of that variable for that time of day over a preceding period of time. The extent of each bar characterizes the observed variation of that variable from its mean over that preceding period of time In this case, it represents plus and minus one standard deviation from the observed mean value.

In the illustrated example, the rule that is being applied is a time over dynamic threshold rule. More specifically, it is an alarm detail report for the latency associated with a WAN element and it uses the time over dynamic threshold rule. It indicates the measure of latency of the element with respect to time. The varying level of center lines 71 from bar to bar indicates that the rule updates its threshold based on mean value calculations and the varying lengths of the bars indicates that the rule is also updating its normal range base on the standard deviation calculations. When line 73 crosses either the upper or lower edges of a bar element 72, for its period of time, LE Engine 100 accumulates the time during which it is outside of the bar and triggers an alarm if the total accumulated time in the analysis window exceeds the condition window as specified in the rule. With report 70, a user is able to view the historical trend of a variable.

If the rule had been a time over a fixed threshold, the center lines of the bars would all have been at the same level and would not have reflected the observed variation in that variable over some preceding period of time.

Reconfiguration

System 10 allows a user to customize the configuration of LE Engine 100 based on how he desires to manage the network. Configuration changes generally include alarm rule additions/deletions, element additions/deletions/modifications, profile additions/deletions/modifications, group or group list additions/deletions/modification, and association additions/deletions, where the association defines a mapping between a profile and a group or a group list.

Reconfiguration Process Flow

In general, the basic flow for reconfiguration includes the following steps:

1. A user makes some changes in the user interface, or the user imports a file containing the configuration changes.
2. Messages describing the changes are broadcast.
3. LE Engine 100 receives messages indicating changes occurred
4. LE Engine 100 updates the state of its internal data structures to reflect the change.

With this process, changes are implemented in LE Engine 100 and related modules are notified. There is no need for re-starting the Engine or re-compiling any files.

One approach to reconfiguration is to make all the necessary updates upon the time LE Engine 100 receiving a reconfiguration message, so that all the changes happen at the same time. However, some times this approach has a poor performance due to inefficiency. An alternative is an amortized approach that allows changes to take place at poll time.

Example: Standard Approach for Alarm Rule Changes

When a user updates an alarm rule in a profile, all elements currently using the profile containing the rule need to be made aware of that change. With the first approach mentioned above, LE Engine 100 needs to update the profile associated with the rule, identify a group or a group list associated with the profile, and find all the elements using the profile in the group or

group list. At this time, all the elements relating to the rule are notified that a change in the alarm rule has occurred. With this approach, it is necessary to examine every association between a profile and a group or a group list, and every group or group list to identify the one associated with the profile, and every element in the system. As a result, this approach is quite inefficient.

Example: Amortized Approach for Alarm Rule Changes

With the amortized approach, only the profile containing the alarm rule is updated at reconfiguration time. Updating each element is left until poll time. This allows reconfiguration to be much simpler, and updating can be done in effectively constant time, at the expense of an overhead at poll time. More specifically, every time an element is polled, it has to check all the profiles it is associated with to determine if any of the profiles has been updated due to the alarm rule change.

System Hardware

Fig. 9 shows a computer system 500 including a workstation display unit 502, an input device (e.g. keyboard) 504, one or more processors 506, and a computer readable medium 508 having a plurality of instructions (e.g. program code) 510 stored thereon. When executed by processors 506, instructions 510 cause processors 506 to implement the above-described functionality of the LiveExceptions system, including the poller module, the configuration module, the LE Engine, the web server and the baseline calculation unit. In addition to storing the program code, the computer readable medium, which might typically be implemented by a combination of disk storage, RAM, and ROM, also implements the data storage that is required in the system.

A number of embodiments of the invention have been described. Nevertheless, it will be understood that various modifications may be made without departing from the spirit and scope of the invention. Accordingly, other embodiments are within the scope of the following claims.

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Ethernet	0	alignmentErrors	Alignment Errors	Alignment Errors	5	2	Frames	0	/sec	DLL_ALGN_ERRORS	11
Ethernet	0	availability	Availability	Availability	161	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Ethernet	0	avgFrameSize	Average Frame Size	Avg Frame Size	700	7	Bytes	4	(bytes)	DELTA_TIME*DLL_BYTES/DLL_FRAMES	310
Ethernet	0	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Ethernet	0	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent	1	%	((DLL_BYTES*8*100.0)/$(speed))	92
Ethernet	0	bandwidthIn	Bandwidth Utilization In	BW Util In	210	4	Percent	1	%	((TR_TOKEN*8*100.0)/$(speed))	87
Ethernet	0	bandwidthOut	Bandwidth Utilization Out	BW Util Out	211	4	Percent	1	%	(((DLL_BYTES-TR_TOKEN)*8*100.0)/$(speed))	269
Ethernet	0	bits	Bits	Bits	437	15	Bits	0	/sec	((DLL_BYTES*8.0)	160
Ethernet	0	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(TR_TOKEN*8.0)	161
Ethernet	0	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	(((DLL_BYTES-TR_TOKEN)*8.0)	268
Ethernet	0	broadcasts	Broadcasts	Broadcasts	3	2	Frames	0	/sec	DLL_BCASTS	4
Ethernet	0	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	DLL_BYTES	2
Ethernet	0	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	TR_TOKEN	23
Ethernet	0	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	DLL_BYTES-TR_TOKEN	265
Ethernet	0	collisions	Collisions	Collisions	6	2	Frames	0	/sec	DLL_COLLISIONS	9
Ethernet	0	collisionsPct	Collisions %	Collisions %	602	4	Percent	1	%	100.0*DELTA_TIME*DLL_COLLISIONS/DLL_FRAMES	191
Ethernet	0	defFramesOut	Deferred Frames (out)	Def Frames Out	626	2	Frames	0	/sec	TR_SIGNAL_LOSS	13
Ethernet	0	discardFrames	Discards	Discards	69	2	Frames	0	/sec	TR_BIT_STREAMING	14
Ethernet	0	discardsIn	Discards In	Discards In	196	2	Frames	0	/sec	TR_FRAME_COPIED	25
Ethernet	0	discardsInPct	Discards In %	Discards In %	529	4	Percent	1	%	100.0*DELTA_TIME*TR_FRAME_COPIED/DLL_FRAMES	270
Ethernet	0	discardsOut	Discards Out	Discards Out	197	2	Frames	0	/sec	TR_BIT_STREAMING-TR_FRAME_COPIED	263
Ethernet	0	discardsOutPct	Discards Out %	Discards Out %	531	4	Percent	1	%	100.0*DELTA_TIME*(TR_BIT_STREAMING-TR_FRAME_COPIED)/DLL_FRAMES	272
Ethernet	0	discardsPct	Discards %	Discards %	604	4	Percent	1	%	100.0*DELTA_TIME*TR_BIT_STREAMING/DLL_FRAMES	274
Ethernet	0	errors	Errors	Errors	7	2	Frames	0	/sec	DLL_ERRORS	10
Ethernet	0	errorsInPct	Errors In %	Errors In %	530	4	Percent	1	%	100.0*DELTA_TIME*TR_FREQUENCY/DLL_FRAMES	271
Ethernet	0	errorsOutPct	Errors Out %	Errors Out %	532	4	Percent	1	%	100.0*DELTA_TIME*(DLL_ERRORS-TR_FREQUENCY)/DLL_FRAMES	273
Ethernet	0	errorsPct	Errors %	Errors %	603	4	Percent	1	%	100.0*DELTA_TIME*DLL_ERRORS/DLL_FRAMES	192
Ethernet	0	faultsIn	Errors In	Errors In	194	0	Rate	0	/sec	TR_FREQUENCY	24
Ethernet	0	faultsOut	Errors Out	Errors Out	195	0	Rate	0	/sec	DLL_ERRORS-TR_FREQUENCY	266
Ethernet	0	frames	Frames	Frames	1	2	Frames	0	/sec	DLL_FRAMES	1
Ethernet	0	framesIn	Frames In	Frames In	28	2	Frames	0	/sec	TR_LOST_FRAME	22
Ethernet	0	framesOut	Frames Out	Frames Out	29	2	Frames	0	/sec	DLL_FRAMES-TR_LOST_FRAME	264
Ethernet	0	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Ethernet	0	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Ethernet	0	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Ethernet	0	mcasts	Multicasts	Multicasts	4	2	Frames	0	/sec	DLL_MCASTS	3
Ethernet	0	nonUnicastIn	Nonunicast In	Nonunicast In	198	2	Frames	0	/sec	TR_SET_RECOVERY_MODE	12
Ethernet	0	nonUnicastOut	Nonunicast Out	Nonunicast Out	199	2	Frames	0	/sec	DLL_MCASTS+DLL_BCASTS-TR_SET_RECOVERY_MODE	267
Ethernet	0	reachableTime	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Ethernet	0	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Ethernet	0	unicast	Unicast	Unicast	711	2	Frames	0	/sec	DLL_FRAMES-DLL_BCASTS-DLL_MCASTS	314
Ethernet	0	unknownProtocols	Unknown Protocol Pkts	Unkn Proto Pkts	104	2	Frames	0	/sec	TR_LINE	16
Token Ring	1	abortErrors	TR Abort Errors	TR Abort Errors	8	2	Frames	0	/sec	TR_ABORT	19
Token Ring	1	addressCopiedErrors	TR Address Copied Errors	TR AddrCopy Errs	434	2	Frames	0	/sec	TR_ADDRESS_COPIED	20
Token Ring	1	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Token Ring	1	avgFrameSize	Average Frame Size	Avg Frame Size	700	7	Bytes	4	(bytes)	DELTA_TIME*DLL_BYTES/DLL_FRAMES	310
Token Ring	1	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Token Ring	1	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent	1	%	((DLL_BYTES*8*100.0)/$(speed))	92
Token Ring	1	bits	Bits	Bits	437	15	Bits	0	/sec	((DLL_BYTES*8.0)	160
Token Ring	1	broadcasts	Broadcasts	Broadcasts	3	2	Frames	0	/sec	DLL_BCASTS	4

Appendix A

label	element_type	symbol	label	short_label	ver_id	units_id	label	units_type	text	col_expression	col_id
Token Ring	1	burstErrors	TR Burst Errors	TR Burst Errors	8	2	Frames		0	/sec	TR_BURST	17
Token Ring	1	bytes	Bytes	Bytes	2	1	Bytes		0	/sec	DLL_BYTES	2
Token Ring	1	congestionErrors	TR Congestion Errors	TR Cong Errors	10	2	Frames		0	/sec	TR_CONGESTION	21
Token Ring	1	errors	Errors	Errors	7	2	Frames		0	/sec	DLL_ERRORS	10
Token Ring	1	frameCopiedErrors	TR Frame Copied Errors	TR Frame Copied	11	2	Frames		0	/sec	TR_FRAME_COPIED	25
Token Ring	1	frames	Frames	Frames	1	2	Frames		0	/sec	DLL_FRAMES	1
Token Ring	1	frequencyErrors	TR Frequency Errors	TR Freq Errors	12	2	Frames		0	/sec	TR_FREQUENCY	24
Token Ring	1	goodPolls	Good Polls	Good Polls	116	4	Percent		1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Token Ring	1	hardErrors	TR Hard Errors	TR Hard Errors	61	2	Frames		0	/sec	TR_SET_RECOVERY_MODE+TR_SIGNAL_LOSS+TR_BIT_STREAMING+TR_CONTENTION_STREAMING	51
Token Ring	1	internalErrors	TR Internal Errs	TR Internal Errs	13	2	Frames		0	/sec	TR_INTERNAL	18
Token Ring	1	latency	Latency	Latency	208	11	Milliseconds		1	(msec)	LATENCY	61
Token Ring	1	lineErrors	TR Line Errors	TR Line Errors	14	2	Frames		0	/sec	TR_LINE	16
Token Ring	1	llcFrames	TR LLC Frames	TR LLC Frames	15	2	Frames		0	/sec	TR_LLC_FRAMES	26
Token Ring	1	lostFrameErrors	TR Lost Frm Err	TR Lost Frm Err	16	2	Frames		0	/sec	TR_LOST_FRAME	22
Token Ring	1	missedPolls	Missed Polls	Missed Polls	119	4	Percent		1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Token Ring	1	multicasts	Multicasts	Multicasts	4	2	Frames		0	/sec	DLL_MCASTS	3
Token Ring	1	reachability	Reachability	Reachability	182	10	Total Time		1	(%)	(REACHABLE_TIME*100.0'DELTA_TIME/(TOTAL_TIME*1.0))	76
Token Ring	1	reboots	Reboots	Reboots	121	4	Percent		1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Token Ring	1	softErrors	TR Soft Errors	TR Soft Errors	62	2	Frames		0	/sec	TR_LINE+TR_BURST+TR_INTERNAL+TR_ABORT+TR_ADDRESS_COPIED+TR_CONGESTION+TR_LOST_FRAME+TR_TOKEN+TR_FREQUENCY+TR_FRAME_COPIED	52
Token Ring	1	tokenErrors	TR Token Errors	TR Token Errors	17	2	Frames		0	/sec	TR_TOKEN	23
Token Ring	1	unicast	Unicast	Unicast	711	2	Frames		0	/sec	DLL_FRAMES-DLL_BCASTS-DLL_MCASTS	314
MIB2LAN	2	alignmentErrors	Alignment Errors	Alignment Errors	5	2	Frames		0	/sec	TR_BURST	17
MIB2LAN	2	availability	Availability	Availability	181	10	Total Time		1	(%)	(AVAILABLE_TIME*100.0)	77
MIB2LAN	2	avgFrameSize	Average Frame Size	Avg Frame Size	700	7	Bytes		4	(bytes)	DELTA_TIME*TR_TOKEN/TR_LOST_FRAME	311
MIB2LAN	2	avgFrameSizeIn	Average Frame Size In	Avg Frame Sz In	701	7	Bytes		4	(bytes)	DELTA_TIME*DLL_BYTES/DLL_FRAMES	310
MIB2LAN	2	avgFrameSizeOut	Average Frame Size Out	Avg Frame Sz Out	702	7	Bytes		4	(bytes)	DELTA_TIME*(TR_TOKEN-DLL_BYTES)/(TR_LOST_FRAME-DLL_FRAMES)	306
MIB2LAN	2	badPolls	Bad Polls	Bad Polls	120	4	Percent		1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
MIB2LAN	2	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent		1	%	((TR_TOKEN*8.*100.0)/$(speed))	87
MIB2LAN	2	bandwidthIn	Bandwidth Utilization In	BW Util In	210	4	Percent		1	%	(((DLL_BYTES*8*100.0)/$(speed))	92
MIB2LAN	2	bandwidthOut	Bandwidth Utilization Out	BW Util Out	211	4	Percent		1	%	(((TR_TOKEN-DLL_BYTES)*8*100.0)/$(speedOut))	80
MIB2LAN	2	bits	Bits	Bits	437	15	Bits		0	/sec	(TR_TOKEN*8.0)	161
MIB2LAN	2	bitsIn	Bits In	Bits In	438	15	Bits		0	/sec	(DLL_BYTES*8.0)	160
MIB2LAN	2	bitsOut	Bits Out	Bits Out	439	15	Bits		0	/sec	((TR_TOKEN-DLL_BYTES)*8.0)	166
MIB2LAN	2	bytes	Bytes	Bytes	2	1	Bytes		0	/sec	TR_TOKEN	23
MIB2LAN	2	bytesIn	Bytes In	Bytes In	18	1	Bytes		0	/sec	DLL_BYTES	2
MIB2LAN	2	bytesOut	Bytes Out	Bytes Out	20	1	Bytes		0	/sec	(TR_TOKEN-DLL_BYTES)	74
MIB2LAN	2	collisionsOut	Collisions Out	Collisions Out	627	2	Frames		0	/sec	DLL_RCV_OFF_FRAMES	6
MIB2LAN	2	collisionsOutPct	Collisions (out) %	Collisions Out %	720	4	Percent		1	%	100.0*DELTA_TIME*DLL_RCV_OFF_FRAMES/(TR_LOST_FRAME-DLL_FRAMES)	327
MIB2LAN	2	defFramesOut	Deferred Frames (out)	Def Frames Out	628	2	Frames		0	/sec	DLL_XMT_OFF_FRAMES	6
MIB2LAN	2	discardedFrames	Discarded Frames	Discarded Frames	57	2	Frames		0	/sec	TR_FRAME_COPIED	25
MIB2LAN	2	discardsIn	Discards In	Discards In	196	2	Frames		0	/sec	DLL_COLLISIONS	9
MIB2LAN	2	discardsInPct	Discards In %	Discards In %	528	4	Percent		1	%	100.0*DELTA_TIME*DLL_COLLISIONS/DLL_FRAMES	191
MIB2LAN	2	discardsOut	Discards Out	Discards Out	197	2	Frames		0	/sec	(TR_FRAME_COPIED-DLL_COLLISIONS)	83
MIB2LAN	2	discardsOutPct	Discards Out %	Discards Out %	531	4	Percent		1	%	100.0*DELTA_TIME*(TR_FRAME_COPIED-DLL_COLLISIONS)/(TR_LOST_FRAME-DLL_FRAMES)	193
MIB2LAN	2	errors	Errors	Errors	7	2	Frames		0	/sec	TR_FREQUENCY	24
MIB2LAN	2	errorsIn	Errors In	Errors In	213	2	Frames		0	/sec	DLL_ERRORS	10
MIB2LAN	2	errorsInPct	Errors In %	Errors In %	530	4	Percent		1	%	100.0*DELTA_TIME*DLL_ERRORS/DLL_FRAMES	192
MIB2LAN	2	errorsOut	Errors Out	Errors Out	212	2	Frames		0	/sec	TR_FREQUENCY-DLL_ERRORS	64

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label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
MIB2LAN	2	errorsOutPct	Errors Out %	Errors Out %	532	4	Percent	1	%	100.0*DELTA_TIME*(TR_FREQUENCY-DLL_ERRORS)/(TR_LOST_FRAME-DLL_FRAMES)	194
MIB2LAN	2	errorsPct	Errors %	Errors %	603	4	Percent	1	%	100.0*DELTA_TIME*TR_FREQUENCY/TR_LOST_FRAME	219
MIB2LAN	2	frames	Frames	Frames	1	2	Frames	0	/sec	TR_LOST_FRAME	22
MIB2LAN	2	framesIn	Frames In	Frames In	28	2	Frames	0	/sec	DLL_FRAMES	1
MIB2LAN	2	framesOut	Frames Out	Frames Out	29	2	Frames	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)	82
MIB2LAN	2	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
MIB2LAN	2	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
MIB2LAN	2	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
MIB2LAN	2	nonUnicast	Nonunicast	Nonunicast	56	2	Frames	0	/sec	DLL_BCASTS	4
MIB2LAN	2	nonUnicastIn	Nonunicast In	Nonunicast In	198	2	Frames	0	/sec	DLL_MCASTS	3
MIB2LAN	2	nonUnicastOut	Nonunicast Out	Nonunicast Out	199	2	Frames	0	/sec	(DLL_BCASTS-DLL_MCASTS)	84
MIB2LAN	2	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
MIB2LAN	2	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
MIB2LAN	2	unicast	Unicast	Unicast	711	2	Frames	0	/sec	TR_LOST_FRAME-DLL_BCASTS	316
MIB2LAN	2	unicastIn	Unicast In	Unicast In	712	2	Frames	0	/sec	DLL_FRAMES-DLL_MCASTS	315
MIB2LAN	2	unicastOut	Unicast Out	Unicast Out	713	2	Frames	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)-(DLL_BCASTS-DLL_MCASTS)	300
MIB2LAN	2	unknownProtocolPackets	Unknown Protocol Pkts	Unkn Proto Pkts	104	2	Frames	0	/sec	TR_LINE	16
Switch Lite Backplane	3	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Switch Lite Backplane	3	avgFrameSize	Average Frame Size	Avg Frame Size	700	7	Bytes	4	(bytes)	DELTA_TIME*TR_TOKEN/TR_LOST_FRAME	311
Switch Lite Backplane	3	backplaneUtilization	Backplane Utilization	Backplane Util	540	4	Percent	1	%	((TR_TOKEN*8*100.0)/$(speedTotal))	79
Switch Lite Backplane	3	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Switch Lite Backplane	3	frames	Frames	Frames	1	2	Frames	0	/sec	TR_LOST_FRAME	22
Switch Lite Backplane	3	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Switch Lite Backplane	3	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Switch Lite Backplane	3	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Switch Lite Backplane	3	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Switch Lite Backplane	3	totalBytes	Total Bytes	Ttl Bytes	124	1	Bytes	0	/sec	TR_TOKEN	23
MIB2LAN	4	alignmentErrors	Alignment Errors	Alignment Errors	5	2	Frames	0	/sec	TR_BURST	17
MIB2LAN	4	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
MIB2LAN	4	avgFrameSize	Average Frame Size	Avg Frame Size	700	7	Bytes	4	(bytes)	DELTA_TIME*TR_TOKEN/TR_LOST_FRAME	311
MIB2LAN	4	avgFrameSizeIn	Average Frame Size In	Avg Frame Sz In	701	7	Bytes	4	(bytes)	DELTA_TIME*DLL_BYTES/DLL_FRAMES	310
MIB2LAN	4	avgFrameSizeOut	Average Frame Size Out	Avg Frame Sz Out	702	7	Bytes	4	(bytes)	DELTA_TIME*(TR_TOKEN-DLL_BYTES)/(TR_LOST_FRAME-DLL_FRAMES)	306
MIB2LAN	4	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
MIB2LAN	4	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent	1	%	((TR_TOKEN*8*100.0)/$(speedTotal))	79
MIB2LAN	4	bandwidthIn	Bandwidth Utilization In	BW Util In	210	4	Percent	1	%	((DLL_BYTES*8*100.0)/$(speedIn))	78
MIB2LAN	4	bandwidthOut	Bandwidth Utilization Out	BW Util Out	211	4	Percent	1	%	(((TR_TOKEN-DLL_BYTES)*8*100.0)/$(speedOut))	80
MIB2LAN	4	bits	Bits	Bits	437	15	Bits	0	/sec	(TR_TOKEN*8.0)	161
MIB2LAN	4	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(DLL_BYTES*8.0)	160
MIB2LAN	4	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	((TR_TOKEN-DLL_BYTES)*8.0)	166
MIB2LAN	4	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	TR_TOKEN	23
MIB2LAN	4	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_BYTES	2
MIB2LAN	4	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	(TR_TOKEN-DLL_BYTES)	74
MIB2LAN	4	collisionsOut	Collisions (out)	Collisions Out	627	2	Frames	0	/sec	DLL_RCV_OFF_FRAMES	5
MIB2LAN	4	collisionsOutPct	Collisions (out) %	Collisions Out %	720	4	Percent	1	%	100.0*DELTA_TIME*DLL_RCV_OFF_FRAMES/(TR_LOST_FRAME-DLL_FRAMES)	327
MIB2LAN	4	defFramesOut	Deferred Frames (out)	Def Frames Out	626	2	Frames	0	/sec	DLL_XMT_OFF_FRAMES	6
MIB2LAN	4	discardedFrames	Discarded Frames	Discarded Frames	57	2	Frames	0	/sec	TR_FRAME_COPIED	25

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
MIB2LAN	4	discardsIn	Discards In	Discards In	196	2	Frames	0	/sec	DLL_COLLISIONS	9
MIB2LAN	4	discardsInPct	Discards In %	Discards In %	529	4	Percent	1	%	100.0*DELTA_TIME*DLL_COLLISIONS/DLL_FRAMES	191
MIB2LAN	4	discardsOut	Discards Out	Discards Out	197	2	Frames	0	/sec	(TR_FRAME_COPIED-DLL_COLLISIONS)	83
MIB2LAN	4	discardsOutPct	Discards Out %	Discards Out %	531	4	Percent	1	%	100.0*DELTA_TIME*(TR_FRAME_COPIED-DLL_COLLISIONS)/(TR_LOST_FRAME-DLL_FRAMES)	193
MIB2LAN	4	errors	Errors	Errors	7	2	Frames	0	/sec	TR_FREQUENCY	24
MIB2LAN	4	errorsIn	Errors In	Errors In	213	2	Frames	0	/sec	DLL_ERRORS	10
MIB2LAN	4	errorsInPct	Errors In %	Errors In %	530	4	Percent	1	%	100.0*DELTA_TIME*DLL_ERRORS/DLL_FRAMES	192
MIB2LAN	4	errorsOut	Errors Out	Errors Out	212	2	Frames	0	/sec	TR_FREQUENCY-DLL_ERRORS	64
MIB2LAN	4	errorsOutPct	Errors Out %	Errors Out %	532	4	Percent	1	%	100.0*DELTA_TIME*(TR_FREQUENCY-DLL_ERRORS)/(TR_LOST_FRAME-DLL_FRAMES)	194
MIB2LAN	4	errorsPct	Errors %	Errors %	603	4	Percent	1	%	100.0*DELTA_TIME*TR_FREQUENCY/TR_LOST_FRAME	219
MIB2LAN	4	frames	Frames	Frames	1	2	Frames	0	/sec	TR_LOST_FRAME	22
MIB2LAN	4	framesIn	Frames In	Frames In	28	2	Frames	0	/sec	DLL_FRAMES	1
MIB2LAN	4	framesOut	Frames Out	Frames Out	29	2	Frames	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)	82
MIB2LAN	4	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
MIB2LAN	4	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
MIB2LAN	4	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
MIB2LAN	4	nonUnicast	Nonunicast	Nonunicast	56	2	Frames	0	/sec	DLL_BCASTS	4
MIB2LAN	4	nonUnicastIn	Nonunicast In	Nonunicast In	198	2	Frames	0	/sec	DLL_MCASTS	3
MIB2LAN	4	nonUnicastOut	Nonunicast Out	Nonunicast Out	199	2	Frames	0	/sec	(DLL_BCASTS-DLL_MCASTS)	84
MIB2LAN	4	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
MIB2LAN	4	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
MIB2LAN	4	unicast	Unicast	Unicast	711	2	Frames	0	/sec	TR_LOST_FRAME-DLL_BCASTS	316
MIB2LAN	4	unicastIn	Unicast In	Unicast In	712	2	Frames	0	/sec	DLL_FRAMES-DLL_MCASTS	315
MIB2LAN	4	unicastOut	Unicast Out	Unicast Out	713	2	Frames	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)-(DLL_BCASTS-DLL_MCASTS)	300
MIB2LAN	4	unknownProtocolPackets	Unknown Protocol Pkts	Unkn Proto Pkts	104	2	Frames	0	/sec	TR_LINE	18
WAN	100	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
WAN	100	avgFrameSize	Average Frame Size	Avg Frame Size	700	7	Bytes	4	(bytes)	DELTA_TIME*TR_TOKEN/TR_LOST_FRAME	311
WAN	100	avgFrameSizeIn	Average Frame Size In	Avg Frame Sz In	701	7	Bytes	4	(bytes)	DELTA_TIME*DLL_BYTES/DLL_FRAMES	310
WAN	100	avgFrameSizeOut	Average Frame Size Out	Avg Frame Sz Out	702	7	Bytes	4	(bytes)	DELTA_TIME*(TR_TOKEN-DLL_BYTES)/(TR_LOST_FRAME-DLL_FRAMES)	306
WAN	100	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
WAN	100	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent	1	%	((TR_TOKEN*8*100.0)/$(speedTotal))	79
WAN	100	bandwidthIn	Bandwidth Utilization In	BW Util In	210	4	Percent	1	%	((DLL_BYTES*8*100.0)/$(speedIn))	78
WAN	100	bandwidthOut	Bandwidth Utilization Out	BW Util Out	211	4	Percent	1	%	(((TR_TOKEN-DLL_BYTES)*8*100.0)/$(speedOut))	80
WAN	100	bits	Bits	Bits	437	15	Bits	0	/sec	(TR_TOKEN*8.0)	161
WAN	100	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(DLL_BYTES*8.0)	160
WAN	100	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	((TR_TOKEN-DLL_BYTES)*8.0)	166
WAN	100	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	TR_TOKEN	23
WAN	100	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_BYTES	2
WAN	100	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	(TR_TOKEN-DLL_BYTES)	74
WAN	100	discardedFrames	Discarded Frames	Discarded Frames	57	2	Frames	0	/sec	TR_FRAME_COPIED	25
WAN	100	discardsIn	Discards In	Discards In	196	2	Frames	0	/sec	DLL_COLLISIONS	9
WAN	100	discardsInPct	Discards In %	Discards In %	529	4	Percent	1	%	100.0*DELTA_TIME*DLL_COLLISIONS/DLL_FRAMES	191
WAN	100	discardsOut	Discards Out	Discards Out	197	2	Frames	0	/sec	(TR_FRAME_COPIED-DLL_COLLISIONS)	83
WAN	100	discardsOutPct	Discards Out %	Discards Out %	531	4	Percent	1	%	100.0*DELTA_TIME*(TR_FRAME_COPIED-DLL_COLLISIONS)/(TR_LOST_FRAME-DLL_FRAMES)	193
WAN	100	errors	Errors	Errors	7	2	Frames	0	/sec	TR_FREQUENCY	24
WAN	100	errorsIn	Errors In	Errors In	213	2	Frames	0	/sec	DLL_ERRORS	10
WAN	100	errorsInPct	Errors In %	Errors In %	530	4	Percent	1	%	100.0*DELTA_TIME*DLL_ERRORS/DLL_FRAMES	192
WAN	100	errorsOut	Errors Out	Errors Out	212	2	Frames	0	/sec	TR_FREQUENCY-DLL_ERRORS	64

Appendix A

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
WAN	100	errorsOutPct	Errors Out %	Errors Out %	532	4	Percent	1	%	100.0*DELTA_TIME*(TR_FREQUENCY-DLL_ERRORS)/(TR_LOST_FRAME-DLL_FRAMES)	194
WAN	100	errorsPct	Errors %	Errors %	603	4	Percent	1	%	100.0*DELTA_TIME*TR_FREQUENCY/TR_LOST_FRAME	219
WAN	100	frames	Frames	Frames	1	2	Frames	0	/sec	TR_LOST_FRAME	22
WAN	100	framesIn	Frames In	Frames In	28	2	Frames	0	/sec	DLL_FRAMES	1
WAN	100	framesOut	Frames Out	Frames Out	29	2	Frames	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)	82
WAN	100	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
WAN	100	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
WAN	100	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
WAN	100	nonUnicast	Nonunicast	Nonunicast	56	2	Frames	0	/sec	DLL_BCASTS	4
WAN	100	nonUnicastIn	Nonunicast In	Nonunicast In	198	2	Frames	0	/sec	DLL_MCASTS	3
WAN	100	nonUnicastOut	Nonunicast Out	Nonunicast Out	199	2	Frames	0	/sec	(DLL_BCASTS-DLL_MCASTS)	84
WAN	100	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
WAN	100	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
WAN	100	unicast	Unicast	Unicast	711	2	Frames	0	/sec	TR_LOST_FRAME-DLL_BCASTS	316
WAN	100	unicastIn	Unicast In	Unicast In	712	2	Frames	0	/sec	DLL_FRAMES-DLL_MCASTS	315
WAN	100	unicastOut	Unicast Out	Unicast Out	713	2	Frames	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)-(DLL_BCASTS-DLL_MCASTS)	300
WAN	100	unknownProtocolPackets	Unknown Protocol Pkts	Unkn Proto Pkts	104	2	Frames	0	/sec	TR_LINE	16
Frame Relay	101	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Frame Relay	101	avgFrameSize	Average Frame Size	Avg Frame Size	700	7	Bytes	4	(bytes)	DELTA_TIME*(BYTES_IN+BYTES_OUT)/(PACKETS_IN+PACKETS_OUT)	305
Frame Relay	101	avgFrameSizeIn	Average Frame Size In	Avg Frame Sz In	701	7	Bytes	4	(bytes)	DELTA_TIME*DLL_BYTES/DLL_FRAMES	310
Frame Relay	101	avgFrameSizeOut	Average Frame Size Out	Avg Frame Sz Out	702	7	Bytes	4	(bytes)	DELTA_TIME*(TR_TOKEN-DLL_BYTES)/(TR_LOST_FRAME-DLL_FRAMES)	306
Frame Relay	101	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Frame Relay	101	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent	1	%	(((BYTES_IN+BYTES_OUT)*8*100.0)/$(speedTotal))	91
Frame Relay	101	bandwidthIn	Bandwidth Utilization In	BW Util In	210	4	Percent	1	%	((BYTES_IN*8*100.0)/$(speedIn))	90
Frame Relay	101	bandwidthOut	Bandwidth Utilization Out	BW Util Out	211	4	Percent	1	%	((BYTES_OUT*8*100.0)/$(speedOut))	89
Frame Relay	101	becnIn	BECN In	BECN In	30	2	Frames	0	/sec	TR_SET_RECOVERY_MODE	12
Frame Relay	101	becnInPct	BECN In %	BECN In %	630	4	Percent	1	%	100.0*DELTA_TIME*TR_SET_RECOVERY_MODE/PACKETS_IN	277
Frame Relay	101	becnOut	BECN Out	BECN Out	31	2	Frames	0	/sec	TR_SIGNAL_LOSS	13
Frame Relay	101	becnOutPct	BECN Out %	BECN Out %	631	4	Percent	1	%	100.0*DELTA_TIME*TR_SIGNAL_LOSS/PACKETS_OUT	278
Frame Relay	101	bits	Bits	Bits	437	15	Bits	0	/sec	(((BYTES_IN+BYTES_OUT)*8.0)	162
Frame Relay	101	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(BYTES_IN*8.0)	164
Frame Relay	101	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	(BYTES_OUT*8.0)	167
Frame Relay	101	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	BYTES_IN+BYTES_OUT	85
Frame Relay	101	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	BYTES_IN	28
Frame Relay	101	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	BYTES_OUT	30
Frame Relay	101	congestionInPct	FECN + BECN In %	FECN/BECN In %	533	4	Percent	1	%	100.0*DELTA_TIME*(TR_SET_RECOVERY_MODE+TR_BIT_STREAMING)/PACKETS_IN	195
Frame Relay	101	congestionOutPct	FECN + BECN Out %	FECN/BECN Out %	534	4	Percent	1	%	100.0*DELTA_TIME*(TR_SIGNAL_LOSS+TR_CONTENTION_STREAMING)/PACKETS_OUT	196
Frame Relay	101	deBytesIn	DE Bytes In	DE Bytes In	40	2	Frames	0	/sec	TR_LOST_FRAME	22
Frame Relay	101	deBytesOut	DE Bytes Out	DE Bytes Out	41	2	Frames	0	/sec	TR_TOKEN	23
Frame Relay	101	deDrops	DE Drops	DE Drops	35	2	Frames	0	/sec	TR_BURST	17
Frame Relay	101	deFramesIn	DE Frames In	DE Frames In	39	2	Frames	0	/sec	TR_ADDRESS_COPIED	20
Frame Relay	101	deFramesInPct	DE Frames In %	DE Frames In %	721	4	Percent	1	%	100.0*DELTA_TIME*TR_ADDRESS_COPIED/PACKETS_IN	328
Frame Relay	101	deFramesOut	DE Frames Out	DE Frames Out	39	2	Frames	0	/sec	TR_CONGESTION	21
Frame Relay	101	deFramesOutPct	DE Frames Out %	DE Frames Out %	722	4	Percent	1	%	100.0*DELTA_TIME*TR_CONGESTION/PACKETS_OUT	329
Frame Relay	101	discards	Discards	Discards	221	2	Frames	0	/sec	TR_LINE	16
Frame Relay	101	discardsPct	Discards %	Discards %	604	4	Percent	1	%	100.0*DELTA_TIME*TR_LINE/(PACKETS_IN+PACKETS_OUT)	221

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col expression	col_id
Frame Relay	101	drops	Drops	Drops	37	2	Frames	0	/sec	TR_ABORT	16
Frame Relay	101	errors	Errors	Errors	7	2	Frames	0	/sec	DLL_ERRORS	10
Frame Relay	101	errorsPct	Errors %	Errors %	603	4	Percent	1	%	100.0*DELTA_TIME*DLL_ERRORS/(PACKETS_IN+PACKETS_OUT)	220
Frame Relay	101	fecnIn	FECN In	FECN In	32	2	Frames	0	/sec	TR_BIT_STREAMING	14
Frame Relay	101	fecnInPct	FECN In %	FECN In %	628	4	Percent	1	%	100.0*DELTA_TIME*TR_BIT_STREAMING/PACKETS_IN	275
Frame Relay	101	fecnOut	FECN Out	FECN Out	33	2	Frames	0	/sec	TR_CONTENTION_STREAMING	15
Frame Relay	101	fecnOutPct	FECN Out %	FECN Out %	628	4	Percent	1	%	100.0*DELTA_TIME*TR_CONTENTION_STREAMING/PACKETS_OUT	276
Frame Relay	101	frames	Frames	Frames	1	2	Frames	0	/sec	(PACKETS_IN+PACKETS_OUT)	75
Frame Relay	101	framesIn	Frames In	Frames In	28	2	Frames	0	/sec	PACKETS_IN	27
Frame Relay	101	framesOut	Frames Out	Frames Out	28	2	Frames	0	/sec	PACKETS_OUT	29
Frame Relay	101	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Frame Relay	101	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	61
Frame Relay	101	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Frame Relay	101	nonDeDrops	Non-DE Drops	Non-DE Drops	36	2	Frames	0	/sec	TR_INTERNAL	16
Frame Relay	101	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Frame Relay	101	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
MDBS	102	avgFrameSize	Average Frame Size	Avg Frame Size	700	7	Bytes	4	(bytes)	DELTA_TIME*TR_TOKEN/TR_LOST_FRAME	311
MDBS	102	avgFrameSizeIn	Average Frame Size In	Avg Frame Sz In	701	7	Bytes	4	(bytes)	DELTA_TIME*DLL_BYTES/DLL_FRAMES	310
MDBS	102	avgFrameSizeOut	Average Frame Size Out	Avg Frame Sz Out	702	7	Bytes	4	(bytes)	DELTA_TIME*(TR_TOKEN+DLL_BYTES)/(TR_LOST_FRAME+DLL_FRAMES)	306
MDBS	102	bits	Bits	Bits	437	15	Bits	0	/sec	(TR_TOKEN*8.0)	161
MDBS	102	blocksCorrectedErrs	Blocks Corrected Errors	Blks Cordd Err	295	2	Frames	0	/sec	PACKETS_IN	27
MDBS	102	blocksTransmitted	Blocks Transmitted	Rvs Blks Tran	297	2	Frames	0	/sec	PACKETS_OUT	29
MDBS	102	blocksUncorrectable	Blocks Uncorrectable	Blks UnCorrect	294	2	Frames	0	/sec	TR_LLC_FRAMES	26
MDBS	102	blocksWrongColorCode	Blocks Wrong Color Code	Blks Wrng CCode	296	2	Frames	0	/sec	BYTES_IN	28
MDBS	102	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	TR_TOKEN	23
MDBS	102	bytesReceived	Bytes Received	Bytes Received	22	1	Bytes	0	/sec	DLL_FRAMES	1
MDBS	102	bytesTransmitted	Bytes Transmitted	Bytes Tx	23	1	Bytes	0	/sec	DLL_BYTES	2
MDBS	102	discardsIn	Discards In	Discards In	196	2	Frames	0	/sec	DLL_COLLISIONS	9
MDBS	102	errors	Errors	Errors	7	2	Frames	0	/sec	DLL_ERRORS	10
MDBS	102	frames	Frames	Frames	1	2	Frames	0	/sec	TR_LOST_FRAME	22
MDBS	102	noRFChannelsTime	No RF Channels Time	No RF Chanl Time	292	10	Total Time	1	(%)	TR_INTERNAL	18
MDBS	102	oddsTransmitted	Odds Transmitted	Rvs Oct Rcvd	298	1	Bytes	0	/sec	BYTES_OUT	30
MDBS	102	openRFChannelsTime	Open RF Channels Time	Open RF Chan Tim	293	10	Total Time	1	(%)	TR_BURST	17
MDBS	102	successfulPlannedHops	Successful Planned Hops	Succ Plan Hop	291	0	Rate	0	/sec	DLL_XMT_OFF_FRAMES	6
MDBS	102	successfulUnplannedHops	Successful Unplanned Hops	Suc Unpln Hop	290	0	Rate	0	/sec	DLL_RCV_OFF_FRAMES	5
MDBS	102	unknownProtocolPkts	Unknown Protocol Pkts	Unkn Proto Pkts	104	2	Frames	0	/sec	TR_LINE	16
Visual Frame Relay	103	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Visual Frame Relay	103	avgFrameSize	Average Frame Size	Avg Frame Size	700	7	Bytes	4	(bytes)	DELTA_TIME*(BYTES_IN+BYTES_OUT)/(PACKETS_IN+PACKETS_OUT)	305
Visual Frame Relay	103	avgFrameSizeIn	Average Frame Size In	Avg Frame Sz In	701	7	Bytes	4	(bytes)	DELTA_TIME*BYTES_IN/PACKETS_IN	307
Visual Frame Relay	103	avgFrameSizeOut	Average Frame Size Out	Avg Frame Sz Out	702	7	Bytes	4	(bytes)	DELTA_TIME*BYTES_OUT/PACKETS_OUT	308
Visual Frame Relay	103	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Visual Frame Relay	103	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent	1	%	(((BYTES_IN+BYTES_OUT)*8*100.0)/$(speedTotal))	91
Visual Frame Relay	103	bandwidthIn	Bandwidth Utilization In	BW Util In	210	4	Percent	1	%	(((BYTES_IN*8*100.0)/$(speedIn))	90
Visual Frame Relay	103	bandwidthOut	Bandwidth Utilization Out	BW Util Out	211	4	Percent	1	%	(((BYTES_OUT*8*100.0)/$(speedOut))	89
Visual Frame Relay	103	becnIn	BECN In	BECN In	30	2	Frames	0	/sec	TR_SET_RECOVERY_MODE	12
Visual Frame Relay	103	becnOut	BECN Out	BECN Out	31	2	Frames	0	/sec	TR_SIGNAL_LOSS	13
Visual Frame Relay	103	bits	Bits	Bits	437	15	Bits	0	/sec	(((BYTES_IN+BYTES_OUT)*8.0)	162
Visual Frame Relay	103	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(BYTES_IN*8.0)	164
Visual Frame Relay	103	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	(BYTES_OUT*8.0)	167
Visual Frame Relay	103	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	BYTES_IN+BYTES_OUT	85

Appendix A

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label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Visual Frame Relay	103	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	BYTES_IN	28
Visual Frame Relay	103	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	BYTES_OUT	30
Visual Frame Relay	103	congestionInPct	FECN + BECN In %	FECN/BECN In %	533	4	Percent	1	%	100.0*DELTA_TIME*(TR_SET_RECOVERY_MODE+TR_BIT_STREAMING)/PACKETS_IN	195
Visual Frame Relay	103	congestionOutPct	FECN + BECN Out %	FECN/BECN Out %	534	4	Percent	1	%	100.0*DELTA_TIME*(TR_SIGNAL_LOSS+TR_CONTENTION_STREAMING)/PACKETS_OUT	196
Visual Frame Relay	103	deBytesIn	DE Bytes In	DE Bytes In	40	2	Frames	0	/sec	TR_LOST_FRAME	22
Visual Frame Relay	103	deBytesOut	DE Bytes Out	DE Bytes Out	41	2	Frames	0	/sec	TR_TOKEN	23
Visual Frame Relay	103	deFramesIn	DE Frames In	DE Frames In	38	2	Frames	0	/sec	TR_ADDRESS_COPIED	20
Visual Frame Relay	103	deFramesOut	DE Frames Out	DE Frames Out	39	2	Frames	0	/sec	TR_CONGESTION	21
Visual Frame Relay	103	errors	Errors	Errors	7	2	Frames	0	/sec	DLL_ERRORS	10
Visual Frame Relay	103	fecnIn	FECN In	FECN In	32	2	Frames	0	/sec	TR_BIT_STREAMING	14
Visual Frame Relay	103	fecnOut	FECN Out	FECN Out	33	2	Frames	0	/sec	TR_CONTENTION_STREAMING	15
Visual Frame Relay	103	frameDeliveryRatio	Frame Delivery Ratio	Frame Del Ratio	559	4	Percent	1	%	(100.0*DLL_BCASTS)	209
Visual Frame Relay	103	frames	Frames	Frames	1	2	Frames	0	/sec	(PACKETS_IN+PACKETS_OUT)	75
Visual Frame Relay	103	framesIn	Frames In	Frames In	28	2	Frames	0	/sec	PACKETS_IN	27
Visual Frame Relay	103	framesOut	Frames Out	Frames Out	29	2	Frames	0	/sec	PACKETS_OUT	29
Visual Frame Relay	103	goodPolls	Good Polls	Good Polls	116	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Visual Frame Relay	103	latency	Round Trip Delay	Round Trip Delay	560	4	Percent	1	%	LATENCY	81
Visual Frame Relay	103	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Visual Frame Relay	103	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Visual Frame Relay	103	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Visual Frame Relay	103	visualBurst1	Burst Advisor Level 1	Burst Advisor 1	554	4	Percent	1	%	(100.0*DLL_RCV_OFF_FRAMES)	204
Visual Frame Relay	103	visualBurst2	Burst Advisor Level 2	Burst Advisor 2	555	4	Percent	1	%	(100.0*DLL_XMT_OFF_FRAMES)	205
Visual Frame Relay	103	visualBurst3	Burst Advisor Level 3	Burst Advisor 3	556	4	Percent	1	%	(100.0*DLL_TRANSITS)	206
Visual Frame Relay	103	visualBurst4	Burst Advisor Level 4	Burst Advisor 4	557	4	Percent	1	%	(100.0*DLL_ENET_FRAMES)	207
Visual Frame Relay	103	visualBurst5	Burst Advisor Level 5	Burst Advisor 5	558	4	Percent	1	%	(100.0*DLL_COLLISIONS)	208
ATM Port	105	aal5Pdus	AAL5 PDUs	AAL5 PDUs	432	8	Cells	0	/sec	DLL_ALGN_ERRORS+TR_SET_RECOVERY_MODE	156
ATM Port	105	aal5PdusDiscarded	Discarded AAL5 PDUs	AAL5PDUs Dsc	433	8	Cells	0	/sec	TR_SIGNAL_LOSS+TR_BIT_STREAMING	157
ATM Port	105	aal5PdusDiscardedIn	Discarded AAL5 PDUs In	AAL5PDUs Dsc In	311	8	Cells	0	/sec	TR_SIGNAL_LOSS	13
ATM Port	105	aal5PdusDiscardedInPct	Discarded AAL5 PDUs In %	AAL5PDU Dsc In %	615	4	Percent	1	%	100.0*DELTA_TIME*TR_SIGNAL_LOSS/DLL_ALGN_ERRORS	226
ATM Port	105	aal5PdusDiscardedOut	Discarded AAL5 PDUs Out	AAL5PDUs Dsc Out	312	8	Cells	0	/sec	TR_BIT_STREAMING	14
ATM Port	105	aal5PdusDiscardedOutPct	Discarded AAL5 PDUs Out %	AAL5PDU Dsc Out%	616	4	Percent	1	%	100.0*DELTA_TIME*TR_BIT_STREAMING/TR_SET_RECOVERY_MODE	227
ATM Port	105	aal5PdusDiscardedPct	Discarded AAL5 PDUs %	AAL5PDU Dsc %	614	4	Percent	1	%	100.0*DELTA_TIME*(TR_SIGNAL_LOSS+TR_BIT_STREAMING)/(DLL_ALGN_ERRORS+TR_SET_RECOVERY_MODE)	225
ATM Port	105	aal5PdusIn	AAL5 PDUs In	AAL5 PDUs In	309	8	Cells	0	/sec	DLL_ALGN_ERRORS	11
ATM Port	105	aal5PdusOut	AAL5 PDUs Out	AAL5 PDUs Out	310	8	Cells	0	/sec	TR_SET_RECOVERY_MODE	12
ATM Port	105	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
ATM Port	105	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
ATM Port	105	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent	1	%	((TR_TOKEN*8*100.0)/$(speedTotal))	79
ATM Port	105	bandwidthIn	Bandwidth Utilization In	BW Util In	210	4	Percent	1	%	((DLL_BYTES*8*100.0)/$(speedIn))	78
ATM Port	105	bandwidthOut	Bandwidth Utilization Out	BW Util Out	211	4	Percent	1	%	(((TR_TOKEN-DLL_BYTES)*8*100.0)/$(speedOut))	80
ATM Port	105	bits	Bits	Bits	437	15	Bits	0	/sec	(TR_TOKEN*8.0)	161
ATM Port	105	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(DLL_BYTES*8.0)	160
ATM Port	105	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	((TR_TOKEN-DLL_BYTES)*8.0)	166
ATM Port	105	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	TR_TOKEN	23
ATM Port	105	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_BYTES	2
ATM Port	105	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	(TR_TOKEN-DLL_BYTES)	74
ATM Port	105	cells	Cells	Cells	184	0	Rate	0	/sec	TR_LOST_FRAME	22
ATM Port	105	cellsIn	Cells In	Cells In	200	0	Rate	0	/sec	DLL_FRAMES	1
ATM Port	105	cellsOut	Cells Out	Cells Out	204	0	Rate	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)	82
ATM Port	105	clp0Cells	CLP0 Cells	CLP0 Cells	423	8	Cells	0	/sec	TR_LOST_FRAME-TR_BURST	134

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
ATM Port	105	clp0CellsIn	CLP0 Cells In	CLP0 Cells In	424	8	Cells	0	/sec	DLL_FRAMES-TR_INTERNAL	135
ATM Port	105	clp0CellsOut	CLP0 Cells Out	CLP0 Cells Out	425	8	Cells	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)-(TR_BURST-TR_INTERNAL)	136
ATM Port	105	clp0Discards	CLP0 Discards	CLP0 Discards	420	8	Cells	0	/sec	TR_FRAME_COPIED-TR_CONTENTION_STREAMING	131
ATM Port	105	clp0DiscardsIn	CLP0 Discards In	CLP0 Discards In	421	8	Cells	0	/sec	DLL_COLLISIONS-TR_LINE	132
ATM Port	105	clp0DiscardsInPct	CLP0 Discards In %	CLP0 Dscds In %	621	4	Percent	1	%	100.0*DELTA_TIME'(DLL_COLLISIONS-TR_LINE))/(DLL_FRAMES-TR_INTERNAL)	232
ATM Port	105	clp0DiscardsOut	CLP0 Discards Out	CLP0 Discards Ou	422	8	Cells	0	/sec	(TR_FRAME_COPIED-TR_CONTENTION_STREAMING)-(DLL_COLLISIONS-TR_LINE)	133
ATM Port	105	clp0DiscardsOutPct	CLP0 Discards Out %	CLP0 Dscds Out %	622	4	Percent	1	%	100.0*DELTA_TIME'((TR_FRAME_COPIED-TR_CONTENTION_STREAMING)-(DLL_COLLISIONS-TR_LINE))/((TR_LOST_FRAME-TR_BURST)-(DLL_FRAMES-TR_INTERNAL))	233
ATM Port	105	clp0DiscardsPct	CLP0 Discards %	CLP0 Dscds %	620	4	Percent	1	%	100.0*DELTA_TIME'(TR_FRAME_COPIED-TR_CONTENTION_STREAMING)/(TR_LOST_FRAME-TR_BURST)	231
ATM Port	105	clp1Cells	CLP1 Cells	CLP1 Cells	411	8	Cells	0	/sec	TR_BURST	17
ATM Port	105	clp1CellsIn	CLP1 Cells In	CLP1 Cells In	412	8	Cells	0	/sec	TR_INTERNAL	18
ATM Port	105	clp1CellsInPct	CLP1 Cells In %	CLP1 Cells In %	717	4	Percent	1	%	100.0*TR_INTERNAL/DLL_FRAMES	319
ATM Port	105	clp1CellsOut	CLP1 Cells Out	CLP1 Cells Out	413	8	Cells	0	/sec	TR_BURST-TR_INTERNAL	126
ATM Port	105	clp1CellsOutPct	CLP1 Cells Out %	CLP1 Cells Out %	718	4	Percent	1	%	100.0*(TR_BURST-TR_INTERNAL)/(TR_LOST_FRAME-DLL_FRAMES)	320
ATM Port	105	clp1CellsPct	CLP1 Cells %	CLP1 Cells %	716	4	Percent	1	%	100.0*TR_BURST/TR_LOST_FRAME	316
ATM Port	105	clp1Discards	CLP1 Discards	CLP1 Disc	409	8	Cells	0	/sec	TR_CONTENTION_STREAMING	15
ATM Port	105	clp1DiscardsIn	CLP1 Discards In	CLP1 Disc In	408	8	Cells	0	/sec	TR_LINE	16
ATM Port	105	clp1DiscardsInPct	CLP1 Discards In %	CLP1 Dscds In %	618	4	Percent	1	%	100.0*DELTA_TIME'TR_LINE/TR_INTERNAL	228
ATM Port	105	clp1DiscardsOut	CLP1 Discards Out	CLP1 Disc Out	410	8	Cells	0	/sec	TR_CONTENTION_STREAMING-TR_LINE	127
ATM Port	105	clp1DiscardsOutPct	CLP1 Discards Out %	CLP1 Dscds Out %	619	4	Percent	1	%	100.0*DELTA_TIME'(TR_CONTENTION_STREAMING-TR_LINE)/(TR_BURST-TR_INTERNAL)	230
ATM Port	105	clp1DiscardsPct	CLP1 Discards %	CLP1 Dscds %	617	4	Percent	1	%	100.0*DELTA_TIME'TR_CONTENTION_STREAMING/TR_BURST	226
ATM Port	105	discards	Discards	Discards	495	6	Cells	0	/sec	TR_FRAME_COPIED	25
ATM Port	105	discardsIn	Discards In	Discards In	491	8	Cells	0	/sec	DLL_COLLISIONS	9
ATM Port	105	discardsInPct	Discards In %	Discards In %	529	4	Percent	1	%	100.0*DELTA_TIME'DLL_COLLISIONS/DLL_FRAMES	191
ATM Port	105	discardsOut	Discards Out	Discards Out	492	8	Cells	0	/sec	(TR_FRAME_COPIED-DLL_COLLISIONS)	83
ATM Port	105	discardsOutPct	Discards Out %	Discards Out %	531	4	Percent	1	%	100.0*DELTA_TIME'(TR_FRAME_COPIED-DLL_COLLISIONS)/(TR_LOST_FRAME-DLL_FRAMES)	193
ATM Port	105	discardsPct	Discards %	Discards %	604	4	Percent	1	%	100.0*DELTA_TIME'TR_FRAME_COPIED/TR_LOST_FRAME	262
ATM Port	105	erroredSeconds	Errored Seconds	Errored Seconds	288	4	Percent	1	%	DLL_XMT_OFF_FRAMES*100.0	153
ATM Port	105	errors	Errors	Errors	496	8	Cells	0	/sec	TR_FREQUENCY	24
ATM Port	105	errorsIn	Errors In	Errors In	493	8	Cells	0	/sec	DLL_ERRORS	10
ATM Port	105	errorsInPct	Errors In %	Errors In %	530	4	Percent	1	%	100.0*DELTA_TIME'DLL_ERRORS/DLL_FRAMES	192
ATM Port	105	errorsOut	Errors Out	Errors Out	494	8	Cells	0	/sec	TR_FREQUENCY-DLL_ERRORS	64
ATM Port	105	errorsOutPct	Errors Out %	Errors Out %	532	4	Percent	1	%	100.0*DELTA_TIME'(TR_FREQUENCY-DLL_ERRORS)/(TR_LOST_FRAME-DLL_FRAMES)	194
ATM Port	105	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS)/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
ATM Port	105	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
ATM Port	105	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS)/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
ATM Port	105	policyViolations	Policy Violations	Policy Vlns	417	8	Cells	0	/sec	TR_LLC_FRAMES	26
ATM Port	105	policyViolationsIn	Policy Violations In	Policy Vlns In	416	8	Cells	0	/sec	PACKETS_IN	27
ATM Port	105	policyViolationsInPct	Policy Violations In %	Plcy Vlns In %	624	4	Percent	1	%	100.0*DELTA_TIME'PACKETS_IN/DLL_FRAMES	235
ATM Port	105	policyViolationsOut	Policy Violations Out	Policy Vlns Out	419	8	Cells	0	/sec	TR_LLC_FRAMES-PACKETS_IN	130
ATM Port	105	policyViolationsOutPct	Policy Violations Out %	Plcy Vlns Out %	625	4	Percent	1	%	100.0*DELTA_TIME'(TR_LLC_FRAMES-PACKETS_IN)/(TR_LOST_FRAME-DLL_FRAMES)	236
ATM Port	105	policyViolationsPct	Policy Violations %	Plcy Vlns %	623	4	Percent	1	%	100.0*DELTA_TIME'TR_LLC_FRAMES/TR_LOST_FRAME	234

Appendix A

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
ATM Port	105	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
ATM Port	105	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
ATM Port	105	sevErroredSeconds	Severely Errored Seconds	Sev Err Seconds	300	4	Percent	1	%	DLL_TRANSITS*100.0	155
ATM Port	105	unavailableSeconds	Unavailable Seconds	Unavail Seconds	302	4	Percent	1	%	DLL_ENET_FRAMES*100.0	154
ATM Path	106	aal5Pdus	AAL5 PDUs	AAL5 PDUs	432	8	Cells	0	/sec	DLL_MCASTS+DLL_COLLISIONS	237
ATM Path	106	aal5PdusDiscarded	Discarded AAL5 PDUs	AAL5PDUs Dsc	433	8	Cells	0	/sec	DLL_FRAMES+DLL_BYTES	249
ATM Path	106	aal5PdusDiscardedIn	Discarded AAL5 PDUs In	AAL5PDUs Dsc In	311	8	Cells	0	/sec	DLL_FRAMES	1
ATM Path	106	aal5PdusDiscardedInPct	Discarded AAL5 PDUs In %	AAL5PDU Dsc In %	615	4	Percent	1	%	100.0*DELTA_TIME*DLL_FRAMES/DLL_MCASTS	251
ATM Path	106	aal5PdusDiscardedOut	Discarded AAL5 PDUs Out	AAL5PDUs Dsc Out	312	8	Cells	0	/sec	DLL_BYTES	2
ATM Path	106	aal5PdusDiscardedOutPct	Discarded AAL5 PDUs Out %	AAL5PDU Dsc Out%	616	4	Percent	1	%	100.0*DELTA_TIME*DLL_BYTES/DLL_COLLISIONS	252
ATM Path	106	aal5PdusDiscardedPct	Discarded AAL5 PDUs %	AAL5PDU Dsc %	614	4	Percent	1	%	100.0*DELTA_TIME*(DLL_FRAMES+DLL_BYTES)/(DLL_MCASTS+DLL_COLLISIONS)	250
ATM Path	106	aal5PdusIn	AAL5 PDUs In	AAL5 PDUs In	309	8	Cells	0	/sec	DLL_MCASTS	3
ATM Path	106	aal5PdusOut	AAL5 PDUs Out	AAL5 PDUs Out	310	8	Cells	0	/sec	DLL_COLLISIONS	9
ATM Path	106	allocatedChannels	Allocated Channels	Allocated Chnls	188	19	Size	4		(TR_BURST+TR_CONGESTION)	96
ATM Path	106	allocatedChannelsIn	Allocated Channels In	Alloc Chan In	203	19	Size	4		TR_BURST	17
ATM Path	106	allocatedChannelsOut	Allocated Channels Out	Alloc Chan Out	207	19	Size	4		TR_CONGESTION	21
ATM Path	106	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
ATM Path	106	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
ATM Path	106	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent	1	%	(((BYTES_IN+BYTES_OUT)*8*100.0)/$(speadTotal))	91
ATM Path	106	bandwidthIn	Bandwidth Utilization In	BW Util In	210	4	Percent	1	%	((BYTES_IN*8*100.0)/$(speedIn))	90
ATM Path	106	bandwidthOut	Bandwidth Utilization Out	BW Util Out	211	4	Percent	1	%	((BYTES_OUT*8*100.0)/$(speedOut))	89
ATM Path	106	bits	Bits	Bits	437	15	Bits	0	/sec	((BYTES_IN+BYTES_OUT)*8.0)	162
ATM Path	106	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(BYTES_IN*8.0)	164
ATM Path	106	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	(BYTES_OUT*8.0)	167
ATM Path	106	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	BYTES_IN+BYTES_OUT	85
ATM Path	106	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	BYTES_IN	28
ATM Path	106	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	BYTES_OUT	30
ATM Path	106	cells	Cells	Cells	184	0	Rate	0	/sec	PACKETS_IN+PACKETS_OUT	70
ATM Path	106	cellsIn	Cells In	Cells In	200	0	Rate	0	/sec	PACKETS_IN	27
ATM Path	106	cellsOut	Cells Out	Cells Out	204	0	Rate	0	/sec	PACKETS_OUT	29
ATM Path	106	clp0Cells	CLP0 Cells	CLP0 Cells	423	8	Cells	0	/sec	(PACKETS_IN+PACKETS_OUT)-TR_INTERNAL	140
ATM Path	106	clp0CellsIn	CLP0 Cells In	CLP0 Cells In	424	8	Cells	0	/sec	PACKETS_IN-TR_ABORT	141
ATM Path	106	clp0CellsOut	CLP0 Cells Out	CLP0 Cells Out	425	8	Cells	0	/sec	PACKETS_OUT-(TR_INTERNAL-TR_ABORT)	142
ATM Path	106	clp0Discards	CLP0 Discards	CLP0 Discards	420	8	Cells	0	/sec	(TR_SET_RECOVERY_MODE+TR_SIGNAL_LOSS)-TR_BIT_STREAMING	144
ATM Path	106	clp0DiscardsIn	CLP0 Discards In	CLP0 Discards In	421	8	Cells	0	/sec	TR_SET_RECOVERY_MODE-TR_CONTENTION_STREAMING	143
ATM Path	106	clp0DiscardsInPct	CLP0 Discards In %	CLP0 Dscds In %	621	4	Percent	1	%	100.0*DELTA_TIME*(TR_SET_RECOVERY_MODE-TR_CONTENTION_STREAMING)/(PACKETS_IN-TR_ABORT)	257
ATM Path	106	clp0DiscardsOut	CLP0 Discards Out	CLP0 Discards Ou	422	8	Cells	0	/sec	TR_SIGNAL_LOSS-(TR_BIT_STREAMING-TR_CONTENTION_STREAMING)	145
ATM Path	106	clp0DiscardsOutPct	CLP0 Discards Out %	CLP0 Dscds Out %	622	4	Percent	1	%	100.0*DELTA_TIME*(TR_SIGNAL_LOSS-(TR_BIT_STREAMING-TR_CONTENTION_STREAMING))/(PACKETS_OUT-(TR_INTERNAL-TR_ABORT))	258
ATM Path	106	clp0DiscardsPct	CLP0 Discards %	CLP0 Dscds %	620	4	Percent	1	%	100.0*DELTA_TIME*((TR_SET_RECOVERY_MODE+TR_SIGNAL_LOSS)-TR_BIT_STREAMING)/((PACKETS_IN+PACKETS_OUT)-TR_INTERNAL)	256
ATM Path	106	clp1Cells	CLP1 Cells	CLP1 Cells	411	8	Cells	0	/sec	TR_INTERNAL	18
ATM Path	106	clp1CellsIn	CLP1 Cells In	CLP1 Cells In	412	8	Cells	0	/sec	TR_ABORT	19
ATM Path	106	clp1CellsInPct	CLP1 Cells In %	CLP1 Cells In %	717	4	Percent	1	%	100.0*TR_ABORT/PACKETS_IN	322
ATM Path	106	clp1CellsOut	CLP1 Cells Out	CLP1 Cells Out	413	8	Cells	0	/sec	TR_INTERNAL-TR_ABORT	138
ATM Path	106	clp1CellsOutPct	CLP1 Cells Out %	CLP1 Cells Out %	718	4	Percent	1	%	100.0*(TR_INTERNAL-TR_ABORT)/PACKETS_OUT	323

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
ATM Path	106	clp1CellsPct	CLP1 Cells %	CLP1 Cells %	716	4	Percent	1	%	100.0*TR_INTERNAL/(PACKETS_IN+PACKETS_OUT)	321
ATM Path	106	clp1Discards	CLP1 Discards	CLP1 Disc	409	8	Cells	0	/sec	TR_BIT_STREAMING	14
ATM Path	106	clp1DiscardsIn	CLP1 Discards In	CLP1 Disc In	408	8	Cells	0	/sec	TR_CONTENTION_STREAMING	16
ATM Path	106	clp1DiscardsInPct	CLP1 Discards In %	CLP1 Discards In %	618	4	Percent	1	%	100.0*DELTA_TIME*TR_LINE/TR_INTERNAL	228
ATM Path	106	clp1DiscardsOut	CLP1 Discards Out	CLP1 Disc Out	410	8	Cells	0	/sec	TR_BIT_STREAMING-TR_CONTENTION_STREAMING	137
ATM Path	106	clp1DiscardsOutPct	CLP1 Discards Out %	CLP1 Discds Out %	619	4	Percent	1	%	100.0*DELTA_TIME*(TR_CONTENTION_STREAMING-TR_LINE)/(TR_BURST-TR_INTERNAL)	230
ATM Path	106	clp1DiscardsPct	CLP1 Discards %	CLP1 Dscds %	617	4	Percent	1	%	100.0*DELTA_TIME*TR_CONTENTION_STREAMING/TR_BURST	229
ATM Path	106	discardedCells	Discarded Cells	Discarded Cells	186	0	Rate	0	/sec	TR_SET_RECOVERY_MODE*TR_SIGNAL_LOSS	04
ATM Path	106	discardedCellsIn	Discarded Cells In	Disc Cells In	201	0	Rate	0	/sec	TR_SET_RECOVERY_MODE	12
ATM Path	105	discardedCellsOut	Discarded Cells Out	Disc Cells Out	205	0	Rate	0	/sec	TR_SIGNAL_LOSS	13
ATM Path	106	discardsInPct	Discards In %	Discards In %	529	4	Percent	1	%	100.0*DELTA_TIME*TR_SET_RECOVERY_MODE/PACKETS_IN	197
ATM Path	106	discardsOutPct	Discards Out %	Discards Out %	531	4	Percent	1	%	100.0*DELTA_TIME*TR_SIGNAL_LOSS/PACKETS_OUT	198
ATM Path	106	discardsPct	Discards %	Discards %	604	4	Percent	1	%	100.0*DELTA_TIME*(TR_SET_RECOVERY_MODE+TR_SIGNAL_LOSS)/((PACKETS_IN+PACKETS_OUT))	245
ATM Path	106	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
ATM Path	106	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	61
ATM Path	106	maximumChannels	Maximum Channels	Maximum Channels	187	0	Rate	0	/sec	TR_LINE+TR_ADDRESS_COPIED	65
ATM Path	105	maximumChannelsIn	Maximum Channels In	Max Channels In	202	0	Rate	0	/sec	TR_LINE	16
ATM Path	106	maximumChannelsOut	Maximum Channels Out	Max Channels Out	206	0	Rate	0	/sec	TR_ADDRESS_COPIED	20
ATM Path	106	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
ATM Path	106	policyViolations	Policy Violations	Policy Vlns	417	8	Cells	0	/sec	TR_FREQUENCY	24
ATM Path	106	policyViolationsIn	Policy Violations In	Policy Vlns In	418	8	Cells	0	/sec	TR_FRAME_COPIED	25
ATM Path	106	policyViolationsInPct	Policy Violations In %	Plcy Vlns In %	624	4	Percent	1	%	100.0*DELTA_TIME*TR_FRAME_COPIED/PACKETS_IN	260
ATM Path	106	policyViolationsOut	Policy Violations Out	Policy Vlns Out	419	8	Cells	0	/sec	TR_FREQUENCY-TR_FRAME_COPIED	61
ATM Path	106	policyViolationsOutPct	Policy Violations Out %	Plcy Vlns Out %	625	4	Percent	1	%	100.0*DELTA_TIME*(TR_FREQUENCY-TR_FRAME_COPIED)/PACKETS_OUT	261
ATM Path	105	policyViolationsPct	Policy Violations %	Plcy Vlns %	623	4	Percent	1	%	100.0*DELTA_TIME*TR_FREQUENCY/(PACKETS_IN+PACKETS_OUT)	259
ATM Path	105	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))/(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	76
ATM Path	106	reboots	Reboots	Reboots	121	4	Percent	1	%	100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
ATM Channel	107	aal5Pdus	AAL5 PDUs	AAL5 PDUs	432	8	Cells	0	/sec	DLL_MCASTS+DLL_COLLISIONS	237
ATM Channel	107	aal5PdusDiscarded	Discarded AAL5 PDUs	AAL5PDUs Disc	433	8	Cells	0	/sec	DLL_FRAMES+DLL_BYTES	238
ATM Channel	107	aal5PdusDiscardedIn	Discarded AAL5 PDUs In	AAL5PDUs Disc In	311	8	Cells	0	/sec	DLL_FRAMES	1
ATM Channel	107	aal5PdusDiscardedInPct	Discarded AAL5 PDUs In %	AAL5PDUs Disc In %	615	4	Percent	1	%	100.0*DELTA_TIME*DLL_FRAMES/DLL_MCASTS	240
ATM Channel	107	aal5PdusDiscardedOut	Discarded AAL5 PDUs Out	AAL5PDUs Disc Out	312	8	Cells	0	/sec	DLL_BYTES	2
ATM Channel	107	aal5PdusDiscardedOutPct	Discarded AAL5 PDUs Out %	AAL5PDUs Disc Out %	616	4	Percent	1	%	100.0*DELTA_TIME*DLL_BYTES/DLL_COLLISIONS	241
ATM Channel	[illegible]	[illegible]	[illegible]	AAL5PDUs Etc %	614	4	Percent	1	%	100.0*DELTA_TIME*(DLL_FRAMES+DLL_BYTES)/(DLL_MCASTS+DLL_COLLISIONS)	239
ATM Channel	[illegible]	[illegible]	[illegible]	AAL5 PDUs In	309	8	Cells	0	/sec	DLL_MCASTS	3
ATM Channel	[illegible]	[illegible]	[illegible]	AAL5 PDUs Out	310	8	Cells	0	/sec	DLL_COLLISIONS	9
ATM Channel	[illegible]	[illegible]	[illegible]	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)/(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	77
ATM Channel	[illegible]	[illegible]	Bad Polls	Bad Polls	120	4	Percent	1	%	(((BYTES_IN+BYTES_OUT)*8*100.0)/$speedTotal))	59
ATM Channel	[illegible]	[illegible]	Bandwidth Utilization	BW Util	209	4	Percent	1	%	(((BYTES_IN*8*100.0)/$speedIn))	81
ATM Channel	[illegible]	[illegible]	Bandwidth Utilization In	BW Util In	210	4	Percent	1	%	(((BYTES_OUT*8*100.0)/$speedOut))	60
ATM Channel	[illegible]	[illegible]	Bandwidth Utilization Out	BW Util Out	211	4	Percent	1	%	((BYTES_IN+BYTES_OUT)*8.0)	69
ATM Channel	[illegible]	[illegible]	Bits	Bits	437	15	Bits	0	/sec	(BYTES_IN*8.0)	162
ATM Channel	[illegible]	[illegible]	Bits In	Bits In	438	15	Bits	0	/sec	(BYTES_OUT*8.0)	164
ATM Channel	[illegible]	[illegible]	Bits Out	Bits Out	439	15	Bits	0	/sec	(BYTES_OUT*8.0)	167
ATM Channel	[illegible]	[illegible]	Bytes	Bytes	2	1	Bytes	0	/sec	BYTES_IN+BYTES_OUT	65
ATM Channel	[illegible]	[illegible]	Bytes In	Bytes In	18	1	Bytes	0	/sec	BYTES_IN	26
ATM Channel	[illegible]	[illegible]	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	BYTES_OUT	30

Appendix A

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
ATM Channel	107	cells	Cells	Cells	184	0	Rate	0	/sec	PACKETS_IN+PACKETS_OUT	70
ATM Channel	107	cellsIn	Cells In	Cells In	200	0	Rate	0	/sec	PACKETS_IN	27
ATM Channel	107	cellsOut	Cells Out	Cells Out	204	0	Rate	0	/sec	PACKETS_OUT	29
ATM Channel	107	clp0Cells	CLP0 Cells	CLP0 Cells	423	8	Cells	0	/sec	(PACKETS_IN+PACKETS_OUT)-TR_BURST	147
ATM Channel	107	clp0CellsIn	CLP0 Cells In	CLP0 Cells In	424	8	Cells	0	/sec	PACKETS_IN-TR_INTERNAL	148
ATM Channel	107	clp0CellsOut	CLP0 Cells Out	CLP0 Cells Out	425	8	Cells	0	/sec	PACKETS_OUT-(TR_BURST-TR_INTERNAL)	149
ATM Channel	107	clp0Discards	CLP0 Discards	CLP0 Discards	420	8	Cells	0	/sec	(TR_SET_RECOVERY_MODE+TR_SIGNAL_LOSS)-TR_CONTENTION_STREAMING	150
ATM Channel	107	clp0DiscardsIn	CLP0 Discards In	CLP0 Discards In	421	8	Cells	0	/sec	TR_SET_RECOVERY_MODE-TR_LINE	151
ATM Channel	107	clp0DiscardsInPct	CLP0 Discards In %	CLP0 Dscds In %	621	4	Percent	1	%	100.0*DELTA_TIME*(TR_SET_RECOVERY_MODE-TR_LINE)/(PACKETS_IN-TR_INTERNAL)	243
ATM Channel	107	clp0DiscardsOut	CLP0 Discards Out	CLP0 Discards Ou	422	8	Cells	0	/sec	TR_SIGNAL_LOSS-(TR_CONTENTION_STREAMING-TR_LINE)	152
ATM Channel	107	clp0DiscardsOutPct	CLP0 Discards Out %	CLP0 Dscds Out %	622	4	Percent	1	%	100.0*DELTA_TIME*((TR_SET_RECOVERY_MODE+TR_SIGNAL_LOSS)-TR_CONTENTION_STREAMING))/((PACKETS_IN+PACKETS_OUT)-TR_BURST)	244
ATM Channel	107	clp0DiscardsPct	CLP0 Discards %	CLP0 Dscds %	620	4	Percent	1	%	100.0*DELTA_TIME*((TR_SET_RECOVERY_MODE+TR_SIGNAL_LOSS)-TR_CONTENTION_STREAMING))/((PACKETS_IN+PACKETS_OUT)-TR_BURST)	242
ATM Channel	107	clp1Cells	CLP1 Cells	CLP1 Cells	411	8	Cells	0	/sec	TR_BURST	17
ATM Channel	107	clp1CellsIn	CLP1 Cells In	CLP1 Cells In	412	8	Cells	0	/sec	TR_INTERNAL	16
ATM Channel	107	clp1CellsInPct	CLP1 Cells In %	CLP1 Cells In %	717	4	Percent	1	%	100.0*TR_INTERNAL/PACKETS_IN	325
ATM Channel	107	clp1CellsOut	CLP1 Cells Out	CLP1 Cells Out	413	8	Cells	0	/sec	TR_BURST-TR_INTERNAL	128
ATM Channel	107	clp1CellsOutPct	CLP1 Cells Out %	CLP1 Cells Out %	718	4	Percent	1	%	100.0*(TR_BURST-TR_INTERNAL)/PACKETS_OUT	326
ATM Channel	107	clp1CellsPct	CLP1 Cells %	CLP1 Cells %	716	4	Percent	1	%	100.0*TR_BURST/(PACKETS_IN+PACKETS_OUT)	324
ATM Channel	107	clp1Discards	CLP1 Discards	CLP1 Discards	409	8	Cells	0	/sec	TR_CONTENTION_STREAMING	15
ATM Channel	107	clp1DiscardsIn	CLP1 Discards In	CLP1 Disc In	408	8	Cells	0	/sec	TR_LINE	16
ATM Channel	107	clp1DiscardsInPct	CLP1 Discards In %	CLP1 Dscds In %	618	4	Percent	1	%	100.0*DELTA_TIME*TR_LINE/TR_INTERNAL	229
ATM Channel	107	clp1DiscardsOut	CLP1 Discards Out	CLP1 Disc Out	410	8	Cells	0	/sec	TR_CONTENTION_STREAMING-TR_LINE	127
ATM Channel	107	clp1DiscardsOutPct	CLP1 Discards Out %	CLP1 Dscds Out %	619	4	Percent	1	%	100.0*DELTA_TIME*(TR_CONTENTION_STREAMING-TR_LINE)/(TR_BURST-TR_INTERNAL)	230
ATM Channel	107	clp1DiscardsPct	CLP1 Discards %	CLP1 Dscds %	617	4	Percent	1	%	100.0*DELTA_TIME*TR_CONTENTION_STREAMING/TR_BURST	228
ATM Channel	107	discardedCells	Discarded Cells	Discarded Cells	186	0	Rate	0	/sec	(TR_SET_RECOVERY_MODE+TR_SIGNAL_LOSS)	94
ATM Channel	107	discardedCellsIn	Discarded Cells In	Disc Cells In	201	0	Rate	0	/sec	TR_SET_RECOVERY_MODE	12
ATM Channel	107	discardedCellsOut	Discarded Cells Out	Disc Cells Out	205	0	Rate	0	/sec	TR_SIGNAL_LOSS	13
ATM Channel	107	discardsInPct	Discards In %	Discards In %	529	4	Percent	1	%	100.0*DELTA_TIME*TR_SET_RECOVERY_MODE/PACKETS_IN	197
ATM Channel	107	discardsOutPct	Discards Out %	Discards Out %	531	4	Percent	1	%	100.0*DELTA_TIME*TR_SIGNAL_LOSS/PACKETS_OUT	198
ATM Channel	107	discardsPct	Discards %	Discards %	604	4	Percent	1	%	100.0*DELTA_TIME*(TR_SET_RECOVERY_MODE+TR_SIGNAL_LOSS)/((PACKETS_IN+PACKETS_OUT))	245
ATM Channel	107	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
ATM Channel	107	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	61
ATM Channel	107	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
ATM Channel	107	policyViolations	Policy Violations	Policy Vlns	417	8	Cells	0	/sec	TR_CONGESTION	21
ATM Channel	107	policyViolationsIn	Policy Violations In	Policy Vlns In	418	8	Cells	0	/sec	TR_LOST_FRAME	22
ATM Channel	107	policyViolationsInPct	Policy Violations In %	Plcy Vlns In %	624	4	Percent	1	%	100.0*DELTA_TIME*TR_LOST_FRAME/PACKETS_IN	247
ATM Channel	107	policyViolationsOut	Policy Violations Out	Policy Vlns Out	419	8	Cells	0	/sec	TR_CONGESTION-TR_LOST_FRAME	146
ATM Channel	107	policyViolationsOutPct	Policy Violations Out %	Plcy Vlns Out %	625	4	Percent	1	%	100.0*DELTA_TIME*(TR_CONGESTION-TR_LOST_FRAME)/PACKETS_OUT	248
ATM Channel	107	policyViolationsPct	Policy Violations %	Plcy Vlns %	623	4	Percent	1	%	100.0*DELTA_TIME*TR_CONGESTION/(PACKETS_IN+PACKETS_OUT)	246
ATM Channel	107	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
ATM Channel	107	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60

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label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Router	200	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Router	200	avgLineUtilization	Av Line Utilization	Av Line Util	66	4	Percent	1	%	DLL_BCASTS	4
Router	200	avgPacketDiscardRate	Av Packet Discard Rate	Av Pkt Dscrd Rte	67	4	Percent	1	%	DLL_RCV_OFF_FRAMES	5
Router	200	avgPacketFault	Av Packet Error Rate	Av Pkt Error	68	4	Percent	1	%	DLL_XMT_OFF_FRAMES	6
Router	200	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Router	200	discardsIn	Discards In	Discards In	196	2	Frames	0	/sec	DLL_COLLISIONS	9
Router	200	discardsOut	Discards Out	Discards Out	197	2	Frames	0	/sec	(TR_FRAME_COPIED-DLL_COLLISIONS)	83
Router	200	errors	Total Errors	Ttl Errors	125	2	Frames	0	/sec	TR_FREQUENCY	24
Router	200	errorsIn	Errors In	Errors In	213	2	Frames	0	/sec	DLL_ERRORS	10
Router	200	errorsInPct	Errors In %	Errors In %	530	4	Percent	1	%	100.0*DELTA_TIME*DLL_ERRORS/DLL_FRAMES	192
Router	200	errorsOut	Errors Out	Errors Out	212	2	Frames	0	/sec	TR_FREQUENCY-DLL_ERRORS	84
Router	200	errorsOutPct	Errors Out %	Errors Out %	532	4	Percent	1	%	100.0*DELTA_TIME*(TR_FREQUENCY-DLL_ERRORS))/(TR_LOST_FRAME-DLL_FRAMES)	194
Router	200	forwardedAtalkPackets	Forwarded Appletalk Pkts	Frwrd Apple Pkts	75	2	Frames	0	/sec	TR_ADDRESS_COPIED	20
Router	200	forwardedDecnetPackets	Forwarded Decnet Pkts	Frwrd Decnt Pkts	73	2	Frames	0	/sec	TR_INTERNAL	18
Router	200	forwardedIpPackets	Forwarded IP Pkts	Frwrd IP Pkts	72	2	Frames	0	/sec	TR_BURST	17
Router	200	forwardedIpxPackets	Forwarded IPX Pkts	Frwrd IPX Pkts	76	2	Frames	0	/sec	TR_CONGESTION	21
Router	200	forwardedXnsPackets	Forwarded XNS Pkts	Frwrd XNS Pkts	74	2	Frames	0	/sec	TR_ABORT	19
Router	200	frames	Total Frames	Ttl Frames	123	2	Frames	0	/sec	TR_LOST_FRAME	22
Router	200	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Router	200	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Router	200	learningBridgedPackets	Lrng Bridged Pkts	Lrng Bridged Pkts	71	2	Frames	0	/sec	TR_CONTENTION_STREAMING	15
Router	200	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Router	200	nonUnicast	Nonunicast	Nonunicast	58	2	Frames	0	/sec	TR_LLC_FRAMES	26
Router	200	nonUnicastIn	Nonunicast In	Nonunicast In	198	2	Frames	0	/sec	DLL_MCASTS	3
Router	200	nonUnicastOut	Nonunicast Out	Nonunicast Out	199	2	Frames	0	/sec	(TR_LLC_FRAMES-DLL_MCASTS)	86
Router	200	otherControlPackets	Other&Cntrl Pkts	Other&Cntrl Pkts	117	2	Frames	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)-TR_BURST-TR_CONGESTION-TR_CONTENTION_STREAMING	33
Router	200	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Router	200	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Router	200	totalBytes	Total Bytes	Ttl Bytes	124	1	Bytes	0	/sec	TR_TOKEN	23
Router	200	totalFramesDiscarded	Total Frames Discarded	Ttl Frms Discard	126	2	Frames	0	/sec	TR_FRAME_COPIED	25
Router	200	totalIncomingBytes	Total Incoming Bytes	Total In Bytes	78	1	Bytes	0	/sec	DLL_BYTES	2
Router	200	totalIncomingPackets	Total Incoming Pkts	Total In Pkts	77	2	Frames	0	/sec	DLL_FRAMES	1
Router	200	totalOutgoingBytes	Total Outgoing Bytes	Ttl Out Bytes	80	1	Bytes	0	/sec	(TR_TOKEN-DLL_BYTES)	74
Router	200	totalOutgoingPackets	Total Outgoing Pkts	Ttl Out Pkts	70	2	Frames	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)	82
Router	200	unknownProtocolPackets	Unknown Protocol Pkts	Unkn Proto Pkts	104	2	Frames	0	/sec	TR_LINE	16
Router	201	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Router	201	avgLineUtilization	Av Line Utilization	Av Line Util	66	4	Percent	1	%	DLL_BCASTS	4
Router	201	avgPacketDiscardRate	Av Packet Discard Rate	Av Pkt Dscrd Rte	67	4	Percent	1	%	DLL_RCV_OFF_FRAMES	5
Router	201	avgPacketFault	Av Packet Error Rate	Av Pkt Error	68	4	Percent	1	%	DLL_XMT_OFF_FRAMES	6
Router	201	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Router	201	bridgedPackets	Bridged Pkts	Bridged Pkts	87	2	Frames	0	/sec	TR_CONTENTION_STREAMING	15
Router	201	discardsIn	Discards In	Discards In	196	2	Frames	0	/sec	DLL_COLLISIONS	9
Router	201	discardsOut	Discards Out	Discards Out	197	2	Frames	0	/sec	(TR_FRAME_COPIED-DLL_COLLISIONS)	83
Router	201	errors	Total Errors	Ttl Errors	125	2	Frames	0	/sec	TR_FREQUENCY	24
Router	201	errorsIn	Errors In	Errors In	213	2	Frames	0	/sec	DLL_ERRORS	10
Router	201	errorsInPct	Errors In %	Errors In %	530	4	Percent	1	%	100.0*DELTA_TIME*DLL_ERRORS/DLL_FRAMES	192
Router	201	errorsOut	Errors Out	Errors Out	212	2	Frames	0	/sec	TR_FREQUENCY-DLL_ERRORS	84
Router	201	errorsOutPct	Errors Out %	Errors Out %	532	4	Percent	1	%	100.0*DELTA_TIME*(TR_FREQUENCY-DLL_ERRORS))/(TR_LOST_FRAME-DLL_FRAMES)	194
Router	201	fastPktsIn	Fast Pkts In	Fast Pkts In	85	2	Frames	0	/sec	TR_SIGNAL_LOSS	13
Router	201	fastPktsOut	Fast Pkts Out	Fast Pkts Out	86	2	Frames	0	/sec	TR_BIT_STREAMING	14

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label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Router	201	forwardedAtalkPackets	Forwarded Appletalk Pkts	Frwrd Apple Pkts	75	2	Frames	0	/sec	TR_ADDRESS_COPIED	20
Router	201	forwardedDecnetPackets	Forwarded Decnet Pkts	Frwrd Decnt Pkts	73	2	Frames	0	/sec	TR_INTERNAL	18
Router	201	forwardedIpPackets	Forwarded IP Pkts	Frwrd IP Pkts	72	2	Frames	0	/sec	TR_BURST	17
Router	201	forwardedIpxPackets	Forwarded IPX Pkts	Frwrd IPX Pkts	76	2	Frames	0	/sec	TR_CONGESTION	21
Router	201	forwardedXnsPackets	Forwarded XNS Pkts	Frwrd XNS Pkts	74	2	Frames	0	/sec	TR_ABORT	19
Router	201	frames	Total Frames	Ttl Frames	123	2	Frames	0	/sec	TR_LOST_FRAME	22
Router	201	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Router	201	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Router	201	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Router	201	nonUnicast	Nonunicast	Nonunicast	56	2	Frames	0	/sec	TR_LLC_FRAMES	26
Router	201	nonUnicastIn	Nonunicast In	Nonunicast In	198	2	Frames	0	/sec	DLL_MCASTS	3
Router	201	nonUnicastOut	Nonunicast Out	Nonunicast Out	199	2	Frames	0	/sec	(TR_LLC_FRAMES-DLL_MCASTS)	88
Router	201	otherControlPackets	Other&Control Pkts	Other&Cntrl Pkts	117	2	Frames	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)-TR_BURST-TR_CONGESTION-TR_CONTENTION_STREAMING	33
Router	201	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Router	201	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Router	201	slowPacketsIn	Slow Pkts In	Slow Pkts In	83	2	Frames	0	/sec	DLL_ALGN_ERRORS	11
Router	201	slowPacketsOut	Slow Pkts Out	Slow Pkts Out	84	2	Frames	0	/sec	TR_SET_RECOVERY_MODE	12
Router	201	totalBytes	Total Bytes	Ttl Bytes	124	1	Bytes	0	/sec	TR_TOKEN	23
Router	201	totalFramesDiscarded	Total Frames Discarded	Ttl Frms Discard	126	2	Frames	0	/sec	TR_FRAME_COPIED	25
Router	201	totalIncomingBytes	Total Incoming Bytes	Total In Bytes	78	1	Bytes	0	/sec	DLL_BYTES	2
Router	201	totalIncomingPackets	Total Incoming Pkts	Total In Pkts	77	2	Frames	0	/sec	DLL_FRAMES	1
Router	201	totalInputQueueDrops	Total Input Queue Drops	Ttl In Q Drops	81	0	Rate	0	/sec	DLL_TRANSITS	7
Router	201	totalOutgoingBytes	Total Outgoing Bytes	Ttl Out Bytes	80	1	Bytes	0	/sec	(TR_TOKEN-DLL_BYTES)	74
Router	201	totalOutgoingPackets	Total Outgoing Pkts	Ttl Out Pkts	79	2	Frames	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)	62
Router	201	totalOutputQueueDrops	Total Output Queue Drops	Ttl Out Q Drops	82	0	Rate	0	/sec	DLL_ENET_FRAMES	8
Router	201	totalQueueDropInOut	Total Queue Drops In&Out	Ttl Queue Drop	115	2	Frames	0	/sec	DLL_TRANSITS+DLL_ENET_FRAMES	31
Router	201	unknownProtocolPackets	Unknown Protocol Pkts	Unkn Proto Pkts	104	2	Frames	0	/sec	TR_LINE	16
Switch Plus Backplane	202	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Switch Plus Backplane	202	backplaneUtilization	Backplane Utilization	Backplane Util	540	4	Percent	1	%	DLL_BCASTS	4
Switch Plus Backplane	202	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Switch Plus Backplane	202	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Switch Plus Backplane	202	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Switch Plus Backplane	202	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Switch Plus Backplane	202	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Switch Plus Backplane	202	totalBytes	Total Bytes	Ttl Bytes	124	1	Bytes	0	/sec	TR_TOKEN	23
Router CPU	250	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Router CPU	250	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Router CPU	250	bufferCreateFailures	Buffer Create Failures	Buf Create Fail	93	5	Per Second	1		BYTES_OUT	30
Router CPU	250	buffersUsed	Buffers Used	Buffers Used	89	6	Buffers	4		TR_CONTENTION_STREAMING	15
Router CPU	250	bufferUtilization	Buffer Utilization	Buffer Util	108	4	Percent	1	%	(FLOAT4(TR_CONTENTION_STREAMING)/FLOAT4(TR_BIT_STREAMING))*DELTA_TIME*100.0	34
Router CPU	250	busDrops	Bus Drops	Bus Drops	90	5	Per Second	1		DLL_ALGN_ERRORS	11
Router CPU	250	cpuUtilization	CPU Utilization	CPU Utilization	91	4	Percent	1	%	TR_SET_RECOVERY_MODE	12
Router CPU	250	freeMemory	Free Memory	Free Memory	92	7	Bytes	4	(bytes)	TR_SIGNAL_LOSS*1000.0	86
Router CPU	250	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Router CPU	250	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Router CPU	250	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Router CPU	250	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Router CPU	250	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Router CPU	250	totalBuffers	Total Buffers	Total Buffers	88	6	Buffers	4		TR_BIT_STREAMING	14
Router CPU	251	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Router CPU	251	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Router CPU	251	bigBufferHits	Big Buffer Hits	Big Buffer Hits	98	5	Per Second	1		TR_ADDRESS_COPIED	20
Router CPU	251	bigBufferMisses	Big Buffer Misses	Big Buffer Misses	99	5	Per Second	1		TR_CONGESTION	21
Router CPU	251	bufferCreateFailures	Buffer Create Failures	Buf Create Fail	93	5	Per Second	1		BYTES_OUT	30
Router CPU	251	bufferHits	Buffer Hits	Buffer Hits	435	5	Per Second	1		(TR_LINE+TR_ADDRESS_COPIED+TR_INTERNAL+TR_LOST_FRAME+TR_FREQUENCY)	158
Router CPU	251	bufferMisses	Buffer Misses	Buffer Misses	436	5	Per Second	1		(TR_BURST+TR_CONGESTION+TR_ABORT+TR_TOKEN+TR_FRAME_COPIED)	159
Router CPU	251	buffersUsed	Buffers Used	Buffers Used	89	6	Buffers	4		TR_CONTENTION_STREAMING	15
Router CPU	251	busDrops	Bus Drops	Bus Drops	90	5	Per Second	1		DLL_ALGN_ERRORS	11
Router CPU	251	cpuUtilization	CPU Utilization	CPU Utilization	91	4	Percent	1	%	TR_SET_RECOVERY_MODE	12
Router CPU	251	freeMemory	Free Memory	Free Memory	92	7	Bytes	4	(bytes)	TR_SIGNAL_LOSS*1000.0	86
Router CPU	251	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Router CPU	251	hugeBufferHits	Huge Buffer Hits	Huge Buffer Hits	102	5	Per Second	1		TR_FREQUENCY	24
Router CPU	251	hugeBufferMisses	Huge Buffer Misses	Huge Buffer Miss	103	5	Per Second	1		TR_FRAME_COPIED	25
Router CPU	251	largeBufferHits	Lge Buffer Hits	Lge Buffer Hits	100	5	Per Second	1		TR_LOST_FRAME	22
Router CPU	251	largeBufferMisses	Lge Buffer Misses	Lge Buffer Miss	101	5	Per Second	1		TR_TOKEN	23
Router CPU	251	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Router CPU	251	mediumBufferHits	Medium Buffer Hits	Med Buffer Hits	96	5	Per Second	1		TR_INTERNAL	18
Router CPU	251	mediumBufferMisses	Medium Buffer Misses	Med Buffer Miss	97	5	Per Second	1		TR_ABORT	19
Router CPU	251	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Router CPU	251	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Router CPU	251	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Router CPU	251	smallBufferHits	Sm Buffer Hits	Sm Buffer Hits	94	5	Per Second	1		TR_LINE	16
Router CPU	251	smallBufferMisses	Small Buffer Misses	Sm Buffer Mis	95	5	Per Second	1		TR_BURST	17
Router CPU	251	totalBuffers	Total Buffers	Total Buffers	88	6	Buffers	4		TR_BIT_STREAMING	14
Switch CPU	252	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Switch CPU	252	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Switch CPU	252	cpuUtilization	CPU Utilization	CPU Utilization	91	4	Percent	1	%	TR_SET_RECOVERY_MODE	12
Switch CPU	252	fanStatus	Fan Status	Fan Status	537	0	Rate	0	/sec	DLL_MCASTS	3
Switch CPU	252	freeMemory	Free Memory	Free Memory	92	7	Bytes	4	(bytes)	TR_LINE	16
Switch CPU	252	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Switch CPU	252	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Switch CPU	252	memoryUsed	Memory Used	Memory Used	375	7	Bytes	4	(bytes)	TR_BURST	17
Switch CPU	252	memoryUtilization	Memory Utilization	Memory Util	168	4	Percent	1	%	(100.0*TR_CONTENTION_STREAMING/TR_BIT_STREAMING))	199
Switch CPU	252	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Switch CPU	252	powerSupply1Status	Power Supply 1 Status	Pwr Sply 1 Stat	535	0	Rate	0	/sec	DLL_FRAMES	1
Switch CPU	252	powerSupply2Status	Power Supply 2 Status	Pwr Sply 2 Stat	536	0	Rate	0	/sec	DLL_BYTES	2
Switch CPU	252	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Switch CPU	252	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Switch CPU	252	temperatureStatus	Temperature Status	Temp Status	538	0	Rate	0	/sec	DLL_BCASTS	4
Switch CPU	252	topologyChanges	Topology Changes	Topology Changes	539	2	Frames	0	/sec	DLL_RCV_OFF_FRAMES	5

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label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Server	300	activeConnections	Active Conns	Active Conn	147	0	Rate	0	/sec	TR_BIT_STREAMING	14
Server	300	avaliability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Server	300	avgCpuUtilization	Average CPU Utilization	Avg CPU Util	162	4	Percent	1	%	DLL_ALGN_ERRORS	11
Server	300	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS)/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Server	300	cpuImbalance	CPU Imbalance	CPU Imbalance	159	4	Percent	1	%	TR_SET_RECOVERY_MODE	12
Server	300	droppedConnections	Dropped Conn	Dropped Conn	148	0	Rate	0	/sec	TR_CONTENTION_STREAMING	15
Server	300	errors	Total Errors	Total Errors	289	2	Frames	0	/sec	TR_FREQUENCY	24
Server	300	fileCacheAttempts	File Cache Attempts	File Cache Atts	143	0	Rate	0	/sec	DLL_TRANSITS+DLL_XMT_OFF_FRAMES	63
Server	300	fileCacheHits	File Cache Hits	File Cache Hits	141	0	Rate	0	/sec	DLL_XMT_OFF_FRAMES	6
Server	300	fileCacheMisses	File Cache Missed	File Cache Missd	142	0	Rate	0	/sec	DLL_TRANSITS	7
Server	300	fileCacheMissRate	File Cache Miss Rate	File Cache Miss	158	4	Percent	1	%	100.0*DELTA_TIME*DLL_TRANSITS/(DLL_TRANSITS+DLL_XMT_OFF_FRAMES)	66
Server	300	frames	Total Packets	Total Packets	164	2	Frames	0	/sec	PACKETS_IN+PACKETS_OUT	70
Server	300	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Server	300	largeCommBuffersUsed	Large Comm Buffers Used	Lrge Comm Buf Usd	167	5	Per Second	1		TR_ADDRESS_COPIED	20
Server	300	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	61
Server	300	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Server	300	pageFaults	Page Faults	Page Faults	146	5	Per Second	1		DLL_ERRORS	10
Server	300	pagesPagedIn	Pages Paged In	Pages Paged In	136	5	Per Second	1		DLL_FRAMES	1
Server	300	pagesPagedOut	Pages Paged Out	Pages Paged Out	137	5	Per Second	1		DLL_MCASTS	3
Server	300	pagesSwappedIn	Pages Swapped In	Pages Swd In	138	5	Per Second	1		DLL_BCASTS	4
Server	300	pagesSwappedOut	Pages Swapped Out	Pages Swd Out	139	5	Per Second	1		DLL_RCV_OFF_FRAMES	5
Server	300	physicalMemoryFree	Physical Memory Free	Phys Mem Free	708	7	Bytes	4	(bytes)	DLL_ENET_FRAMES-DLL_COLLISIONS	313
Server	300	physicalMemoryUsed	Physical Memory Used	Physical Memory	145	7	Bytes	4	(bytes)	DLL_COLLISIONS	9
Server	300	physicalMemoryUtilization	Physical Memory Utilization	Physical Memory	160	4	Percent	1	%	100.0*DELTA_TIME*DLL_COLLISIONS/DLL_ENET_FRAMES	68
Server	300	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Server	300	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Server	300	smallCommBuffersDropped	Small Comm Buffers Dropped	Small Comm Buff	165	5	Per Second	1		TR_INTERNAL	18
Server	300	totalBytes	Total Bytes	Total Bytes	140	1	Bytes	0	/sec	BYTES_IN+BYTES_OUT	85
Server	300	totalCommFault	Total Comm Error	Total Comm Error	163	5	Per Second	1		TR_FREQUENCY-TR_FRAME_COPIED	61
Server	300	totalFramesDiscarded	Total Frames Discarded	TB Frms Discard	126	2	Frames	0	/sec	TR_FRAME_COPIED	25
Server	300	totalIncomingBytes	Total Incoming Bytes	Total In Bytes	78	1	Bytes	0	/sec	BYTES_IN	28
Server	300	totalIncomingPackets	Total Incoming Pkts	Total In Pkts	77	2	Frames	0	/sec	PACKETS_IN	27
Server	300	totalLargeCommBuffers	Total Large Comm Buffers	TB Lrge Comm Buf	166	5	Per Second	1		TR_ABORT	19
Server	300	totalOutgoingBytes	Total Outgoing Bytes	TB Out Bytes	80	1	Bytes	0	/sec	BYTES_OUT	30
Server	300	totalOutgoingPackets	Total Outgoing Pkts	TB Out Pkts	79	2	Frames	0	/sec	PACKETS_OUT	29
Server	300	totalPhysicalMemory	Total Physical Memory	Total Phys Mem	144	7	Bytes	4	(bytes)	DLL_ENET_FRAMES	8
Server	300	totalVirtualMemory	Total Virtual Memory	Total Vir Mem	149	7	Bytes	4	(bytes)	TR_LINE	16
Server	300	virtualMemoryUsed	Virtual Memory Used	Vir Mem Used	150	7	Bytes	4	(bytes)	TR_BURST	17
Server	300	virtualMemoryUtilization	Virtual Memory Utilization	Virt Mem Util	161	4	Percent	1	%	100.0*DELTA_TIME*TR_BURST/TR_LINE	69
Server	301	activeConnections	Active Connections	Active Conn	147	0	Rate	0	/sec	TR_BIT_STREAMING	14
Server	301	avaliability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Server	301	avgCpuUtilization	Average CPU Utilization	Avg CPU Util	162	4	Percent	1	%	DLL_ALGN_ERRORS	11
Server	301	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Server	301	cpuImbalance	CPU Imbalance	CPU Imbalance	159	4	Percent	1	%	TR_SET_RECOVERY_MODE	12
Server	301	droppedConnections	Dropped Connections	Dropped Conn	148	0	Rate	0	/sec	TR_CONTENTION_STREAMING	15
Server	301	errors	Total Errors	Total Errors	289	2	Frames	0	/sec	TR_FREQUENCY	24
Server	301	fileCacheAttempts	File Cache Attempts	File Cache Atts	143	0	Rate	0	/sec	DLL_TRANSITS+DLL_XMT_OFF_FRAMES	63
Server	301	fileCacheHits	File Cache Hits	File Cache Hits	141	0	Rate	0	/sec	DLL_XMT_OFF_FRAMES	6
Server	301	fileCacheMisses	File Cache Misses	File Cache Missd	142	0	Rate	0	/sec	DLL_TRANSITS	7
Server	301	fileCacheMissRate	File Cache Miss Rate	File Cache Miss	158	4	Percent	1	%	100.0*DELTA_TIME*DLL_TRANSITS/(DLL_TRANSITS+DLL_XMT_OFF_FRAMES)	66

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label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Server	301	frames	Total Packets	Total Packets	164	2	Frames	0	/sec	PACKETS_IN+PACKETS_OUT	70
Server	301	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	67
Server	301	largeCommBuffersUsed	Large Com Buf Used	Lrge Com Buf Usd	167	5	Per Second	1		TR_ADDRESS_COPIED	20
Server	301	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	61
Server	301	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Server	301	physicalMemoryFree	Physical Memory Free	Phys Mem Free	708	7	Bytes	4	(bytes)	DLL_ENET_FRAMES-DLL_COLLISIONS	313
Server	301	physicalMemoryUsed	Physical Memory Used	Physical Memory	145	7	Bytes	4	(bytes)	DLL_COLLISIONS	9
Server	301	physicalMemoryUtilization	Physical Memory Utilization	Physical Memory	160	4	Percent	1	%	100.0*DELTA_TIME*DLL_COLLISIONS/DLL_ENET_FRAMES	68
Server	301	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	78
Server	301	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Server	301	smallCommBuffersDropped	Small Comm Buff	Small Comm Buff	165	5	Per Second	1		TR_INTERNAL	18
Server	301	totalBytes	Total Bytes	Total Bytes	140	1	Bytes	0	/sec	BYTES_IN+BYTES_OUT	85
Server	301	totalCommsFault	Total Comm Error	Total Comm Error	163	5	Per Second	1		TR_FREQUENCY*TR_FRAME_COPIED	61
Server	301	totalFramesDiscarded	Total Frames Discard	Tll Frms Discard	126	2	Frames	0	/sec	TR_FRAME_COPIED	25
Server	301	totalIncomingBytes	Total Incoming Bytes	Total In Bytes	78	1	Bytes	0	/sec	BYTES_IN	28
Server	301	totalIncomingPackets	Total Incoming Pkts	Total In Pkts	77	2	Frames	0	/sec	PACKETS_IN	27
Server	301	totalLargeCommBuffers	Total Large Comm Buffers	Tll Lrge Com Buf	166	5	Per Second	1		TR_ABORT	10
Server	301	totalOutgoingBytes	Total Outgoing Bytes	Tll Out Bytes	80	1	Bytes	0	/sec	BYTES_OUT	30
Server	301	totalOutgoingPackets	Total Outgoing Pkts	Tll Out Pkts	79	2	Frames	0	/sec	PACKETS_OUT	29
Server	301	totalPhysicalMemory	Total Physical Memory	Total Phys Mem	144	7	Bytes	4	(bytes)	DLL_ENET_FRAMES	8
Server	302	activeConnections	Active Connections	Active Conn	147	0	Rate	0	/sec	TR_BIT_STREAMING	14
Server	302	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Server	302	avgCpuUtilization	Average CPU Utilization	Avg CPU Util	162	4	Percent	1	%	DLL_ALGN_ERRORS	11
Server	302	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Server	302	cpuImbalance	CPU Imbalance	CPU Imbalance	159	4	Percent	1	%	TR_SET_RECOVERY_MODE	12
Server	302	droppedConnections	Dropped Connections	Dropped Conn	148	0	Rate	0	/sec	TR_CONTENTION_STREAMING	16
Server	302	errors	Total Errors	Total Errors	289	2	Frames	0	/sec	TR_FREQUENCY	24
Server	302	fileCacheAttempts	File Cache Attempts	File Cache Atts	143	0	Rate	0	/sec	DLL_TRANSITS+DLL_XMT_OFF_FRAMES	63
Server	302	fileCacheHits	File Cache Hits	File Cache Hits	141	0	Rate	0	/sec	DLL_XMT_OFF_FRAMES	6
Server	302	fileCacheMisses	File Cache Missed	File Cache Missd	142	0	Rate	0	/sec	DLL_TRANSITS	7
Server	302	fileCacheMissRate	File Cache Miss Rate	File Cache Miss	158	4	Percent	1	%	100.0*DELTA_TIME*DLL_TRANSITS/(DLL_TRANSITS+DLL_XMT_OFF_FRAMES)	66
Server	302	frames	Total Packets	Total Packets	164	2	Frames	0	/sec	PACKETS_IN+PACKETS_OUT	70
Server	302	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	67
Server	302	largeCommBuffersUsed	Large Comm Buffers Used	Lrge Com Buf Usd	167	5	Per Second	1		TR_ADDRESS_COPIED	20
Server	302	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	61
Server	302	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Server	302	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	70
Server	302	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Server	302	smallCommBuffersDropped	Small Comm Buffers Dropped	Small Comm Buff	165	5	Per Second	1		TR_INTERNAL	18
Server	302	totalBytes	Total Bytes	Total Bytes	140	1	Bytes	0	/sec	BYTES_IN+BYTES_OUT	85
Server	302	totalCommsFault	Total Comm Errors	Total Comm Error	163	5	Per Second	1		TR_FREQUENCY*TR_FRAME_COPIED	61
Server	302	totalFramesDiscarded	Total Frames Discarded	Tll Frms Discard	126	2	Frames	0	/sec	TR_FRAME_COPIED	25
Server	302	totalIncomingBytes	Total Incoming Bytes	Total In Bytes	78	1	Bytes	0	/sec	BYTES_IN	28
Server	302	totalIncomingPackets	Total Incoming Pkts	Total In Pkts	77	2	Frames	0	/sec	PACKETS_IN	27
Server	302	totalLargeCommBuffers	Total Large Comm Buffers	Tll Lrge Com Buf	166	5	Per Second	1		TR_ABORT	10
Server	302	totalOutgoingBytes	Total Outgoing Bytes	Tll Out Bytes	80	1	Bytes	0	/sec	BYTES_OUT	30
Server	302	totalOutgoingPackets	Total Outgoing Pkts	Tll Out Pkts	79	2	Frames	0	/sec	PACKETS_OUT	29
Server	303	activeConnections	Active Connections	Active Conn	147	0	Rate	0	/sec	TR_BIT_STREAMING	14

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label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Server	303	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Server	303	avgCpuUtilization	Average CPU Utilization	Avg CPU Util	162	4	Percent	1	%	DLL_ALGN_ERRORS	11
Server	303	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Server	303	cpuImbalance	CPU Imbalance	CPU Imbalance	159	4	Percent	1	%	TR_SET_RECOVERY_MODE	12
Server	303	droppedConnections	Dropped Connections	Dropped Conn	148	0	Rate	0	/sec	TR_CONTENTION_STREAMING	15
Server	303	errors	Total Errors	Total Errors	289	2	Frames	0	/sec	TR_FREQUENCY	24
Server	303	fileCacheAttempts	File Cache Attempts	File Cache Atts	143	0	Rate	0	/sec	DLL_TRANSITS+DLL_XMT_OFF_FRAMES	63
Server	303	fileCacheHits	File Cache Hits	File Cache Hits	141	0	Rate	0	/sec	DLL_XMT_OFF_FRAMES	6
Server	303	fileCacheMisses	File Cache Misses	File Cache Missd	142	0	Rate	0	/sec	DLL_TRANSITS	7
Server	303	fileCacheMissRate	File Cache Miss Rate	File Cache Miss	158	4	Percent	1	%	100.0*DELTA_TIME*DLL_TRANSITS/(DLL_TRANSITS+DLL_XMT_OFF_FRAMES)	66
Server	303	frames	Total Packets	Total Packets	164	2	Frames	0	/sec	PACKETS_IN+PACKETS_OUT	70
Server	303	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Server	303	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Server	303	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Server	303	pageFaults	Page Faults	Page Faults	146	5	Per Second	1		DLL_ERRORS	10
Server	303	pagesPagedIn	Pages Paged In	Pages Paged In	136	5	Per Second	1		DLL_FRAMES	1
Server	303	pagesPagedOut	Pages Paged Out	Pages Paged Out	137	5	Per Second	1		DLL_MCASTS	3
Server	303	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Server	303	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Server	303	totalBytes	Total Bytes	Total Bytes	140	1	Bytes	0	/sec	BYTES_IN+BYTES_OUT	85
Server	303	totalCommFault	Total Comm Errors	Total Comm Error	163	5	Per Second	1		TR_FREQUENCY-TR_FRAME_COPIED	61
Server	303	totalIncomingBytes	Total Incoming Bytes	Total In Bytes	78	1	Bytes	0	/sec	BYTES_IN	28
Server	303	totalIncomingPackets	Total Incoming Pkts	Total In Pkts	77	2	Frames	0	/sec	PACKETS_IN	27
Server	303	totalOutgoingBytes	Total Outgoing Bytes	Ttl Out Bytes	80	1	Bytes	0	/sec	BYTES_OUT	30
Server	303	totalOutgoingPackets	Total Outgoing Pkts	Ttl Out Pkts	79	2	Frames	0	/sec	PACKETS_OUT	29
Server	304	activeConnections	Active Connections	Active Conn	147	0	Rate	0	/sec	TR_BIT_STREAMING	14
Server	304	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Server	304	avgCpuUtilization	Average CPU Utilization	Avg CPU Util	162	4	Percent	1	%	DLL_ALGN_ERRORS	11
Server	304	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Server	304	cpuImbalance	CPU Imbalance	CPU Imbalance	159	4	Percent	1	%	TR_SET_RECOVERY_MODE	12
Server	304	errors	Total Errors	Total Errors	289	2	Frames	0	/sec	TR_FREQUENCY	24
Server	304	frames	Total Packets	Total Packets	164	2	Frames	0	/sec	PACKETS_IN+PACKETS_OUT	70
Server	304	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Server	304	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Server	304	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Server	304	pageFaults	Page Faults	Page Faults	146	5	Per Second	1		DLL_ERRORS	10
Server	304	pagesPagedIn	Pages Paged In	Pages Paged In	136	5	Per Second	1		DLL_FRAMES	1
Server	304	pagesPagedOut	Pages Paged Out	Pages Paged Out	137	5	Per Second	1		DLL_MCASTS	3
Server	304	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Server	304	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Server	304	totalBytes	Total Bytes	Total Bytes	140	1	Bytes	0	/sec	BYTES_IN+BYTES_OUT	85
Server	304	totalCommFault	Total Comm Errors	Total Comm Error	163	5	Per Second	1		TR_FREQUENCY-TR_FRAME_COPIED	61
Server	304	totalIncomingBytes	Total Incoming Bytes	Total In Bytes	78	1	Bytes	0	/sec	BYTES_IN	28
Server	304	totalIncomingPackets	Total Incoming Pkts	Total In Pkts	77	2	Frames	0	/sec	PACKETS_IN	27
Server	304	totalOutgoingBytes	Total Outgoing Bytes	Ttl Out Bytes	80	1	Bytes	0	/sec	BYTES_OUT	30
Server	304	totalOutgoingPackets	Total Outgoing Pkts	Ttl Out Pkts	79	2	Frames	0	/sec	PACKETS_OUT	29
Server	304	totalVirtualMemory	Total Virtual Memory	Total Vir Mem	149	7	Bytes	4	(bytes)	TR_LINE	16
Server	304	virtualMemoryUsed	Virtual Memory Used	Vir Mem Used	150	7	Bytes	4	(bytes)	TR_BURST	17

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Server	304	virtualMemoryUtilization	Virtual Memory Utilization	Virt Mem Util	161	4	Percent	1	%	100.0*DELTA_TIME*TR_BURST/TR_LINE	69
Server	305	activeConnections	Active Connections	Active Conn	147	0	Rate	0	/sec	TR_BIT_STREAMING	14
Server	305	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Server	305	avgCpuUtilization	Average CPU Utilization	Avg CPU Util	162	4	Percent	1	%	DLL_ALGN_ERRORS	111
Server	305	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Server	305	cpuImbalance	CPU Imbalance	CPU Imbalance	159	4	Percent	1	%	TR_SET_RECOVERY_MODE	12
Server	305	droppedConnections	Dropped Connections	Dropped Conn	146	0	Rate	0	/sec	TR_CONTENTION_STREAMING	16
Server	305	errors	Total Errors	Total Errors	289	2	Frames	0	/sec	TR_FREQUENCY	24
Server	305	fileCacheAttempts	File Cache Attempts	File Cache Atts	143	0	Rate	0	/sec	DLL_TRANSITS+DLL_XMT_OFF_FRAMES	63
Server	305	fileCacheHits	File Cache Hits	File Cache Hits	141	0	Rate	0	/sec	DLL_XMT_OFF_FRAMES	6
Server	305	fileCacheMisses	File Cache Misses	File Cache Missd	142	0	Rate	0	/sec	DLL_TRANSITS	7
Server	305	fileCacheMissRate	File Cache Miss Rate	File Cache Miss	158	4	Percent	1	%	100.0*DELTA_TIME*DLL_TRANSITS/(DLL_TRANSITS+DLL_XMT_OFF_FRAMES)	66
Server	305	frames	Total Packets	Total Packets	164	2	Frames	0	/sec	PACKETS_IN+PACKETS_OUT	70
Server	305	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Server	305	interrupts	Interrupts	Interrupts	580	0	Rate	0	/sec	TR_SIGNAL_LOSS	13
Server	305	largeCommBuffersUsed	Large Comm Buffers Used	Lrge Comm Buf Used	167	5	Per Second	1		TR_ADDRESS_COPIED	20
Server	305	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	91
Server	305	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Server	305	pageFaults	Page Faults	Page Faults	146	5	Per Second	1		DLL_ERRORS	10
Server	305	pagesPagedIn	Pages Paged In	Pages Paged In	136	5	Per Second	1		DLL_FRAMES	1
Server	305	pagesPagedOut	Pages Paged Out	Pages Paged Out	137	5	Per Second	1		DLL_MCASTS	3
Server	305	pagesSwappedIn	Pages Swapped In	Pages Swd In	138	5	Per Second	1		DLL_BCASTS	4
Server	305	pagesSwappedOut	Pages Swapped Out	Pages Swd Out	139	5	Per Second	1		DLL_RCV_OFF_FRAMES	5
Server	305	physicalMemoryFree	Physical Memory Free	Phys Memory Free	559	7	Bytes	4	(bytes)	(DLL_ENET_FRAMES-DLL_COLLISIONS)	216
Server	305	physicalMemoryUsed	Physical Memory Used	Physical Memory	145	7	Bytes	4	(bytes)	DLL_COLLISIONS	9
Server	305	physicalMemoryUtilization	Physical Memory Utilization	Physical Memory	160	4	Percent	1	%	100.0*DELTA_TIME*DLL_COLLISIONS/DLL_ENET_FRAMES	68
Server	305	processes	Processes	Processes	576	19	Size	4		TR_TOKEN	23
Server	305	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Server	305	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Server	305	runQueueLength	CPU Run Queue Length	Run Queue Length	577	13	Gauge	1		DLL_BYTES	2
Server	305	smallCommBuffersDropped	Small Comm Buffers Dropped	Small Comm Buf	165	5	Per Second	1		TR_INTERNAL	16
Server	305	systemCalls	System Calls	System Calls	579	0	Rate	0	/sec	TR_LOST_FRAME	22
Server	305	totalBytes	Total Bytes	Total Bytes	140	1	Bytes	0	/sec	BYTES_IN+BYTES_OUT	85
Server	305	totalCommError	Total Comm Error	Total Comm Error	163	5	Per Second	1		TR_FREQUENCY-TR_FRAME_COPIED	61
Server	305	totalCpuUtilization	Total CPU Utilization	Total CPU Util	597	4	Percent	1	%	TR_LLC_FRAMES	26
Server	305	totalFramesDiscarded	Total Frames Discarded	Ttl Frms Discard	128	2	Frames	0	/sec	TR_FRAME_COPIED	25
Server	305	totalIncomingBytes	Total Incoming Bytes	Total In Bytes	78	1	Bytes	0	/sec	BYTES_IN	28
Server	305	totalIncomingPackets	Total Incoming Pkts	Total In Pkts	77	2	Frames	0	/sec	PACKETS_IN	27
Server	305	totalLargeCommBuffers	Total Large Comm Buffers	Ttl Lrge Comm Buf	166	5	Per Second	1		TR_ABORT	19
Server	305	totalOutgoingBytes	Total Outgoing Bytes	Ttl Out Bytes	80	1	Bytes	0	/sec	BYTES_OUT	30
Server	305	totalOutgoingPackets	Total Outgoing Pkts	Ttl Out Pkts	79	2	Frames	0	/sec	PACKETS_OUT	29
Server	305	totalPhysicalMemory	Total Physical Memory	Total Phys Mem	144	7	Bytes	4	(bytes)	DLL_ENET_FRAMES	8
Server	305	totalVirtualMemory	Total Virtual Memory	Total Vir Mem	149	7	Bytes	4	(bytes)	TR_LINE	16
Server	305	users	Users	Users	598	19	Size	4		TR_BIT_STREAMING	14
Server	305	virtualMemoryFree	Virtual Memory Free	Virt Memory Free	600	7	Bytes	4	(bytes)	(TR_LINE-TR_BURST)	217
Server	305	virtualMemoryUsed	Virtual Memory Used	Vir Mem Used	150	7	Bytes	4	(bytes)	TR_BURST	11
Server	305	virtualMemoryUtilization	Virtual Memory Utilization	Virt Mem Util	161	4	Percent	1	%	100.0*DELTA_TIME*TR_BURST/TR_LINE	69
Server	306	activeConnections	Active Connections	Active Conn	147	0	Rate	0	/sec	TR_BIT_STREAMING	14
Server	306	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Server	306	avgCpuUtilization	Average CPU Utilization	Avg CPU Util	162	4	Percent	1	%	DLL_ALGN_ERRORS	111
Server	306	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59

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label	element_type	symbol	label	short_label	ver_id	units_id	label	units_type	text	col_expression	col_id
Server	306	cpuImbalance	CPU Imbalance	CPU Imbalance	159	4	Percent	1	%	TR_SET_RECOVERY_MODE	12
Server	306	droppedConnections	Dropped Connections	Dropped Conn	148	0	Rate	0	/sec	TR_CONTENTION_STREAMING	15
Server	306	errors	Total Errors	Total Errors	289	2	Frames	0	/sec	TR_FREQUENCY	24
Server	306	fileCacheAttempts	File Cache Attempts	File Cache Atts	143	0	Rate	0	/sec	DLL_TRANSITS+DLL_XMT_OFF_FRAMES	63
Server	306	fileCacheHits	File Cache Hits	File Cache Hits	141	0	Rate	0	/sec	DLL_XMT_OFF_FRAMES	6
Server	306	fileCacheMisses	File Cache Misses	File Cache Missd	142	0	Rate	0	/sec	DLL_TRANSITS	7
Server	306	fileCacheMissRate	File Cache Miss Rate	File Cache Miss	158	4	Percent	1	%	100.0*DELTA_TIME*DLL_TRANSITS/(DLL_TRANSITS+DLL_XMT_OFF_FRAMES)	66
Server	306	frames	Total Packets	Total Packets	164	2	Frames	0	/sec	PACKETS_IN+PACKETS_OUT	70
Server	306	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Server	306	interrupts	Interrupts	Interrupts	580	0	Rate	0	/sec	TR_SIGNAL_LOSS	13
Server	306	largeCommBuffersUsed	Large Comm Buffers Used	Lrge Com Buf Usd	167	5	Per Second	1		TR_ADDRESS_COPIED	20
Server	306	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Server	306	loadAverage	CPU Load Average	Load Average	574	13	Gauge	1		DLL_BYTES	2
Server	306	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Server	306	pageFaults	Page Faults	Page Faults	146	5	Per Second	1		DLL_ERRORS	10
Server	306	pageScanRate	Page Scan Rate	Page Scan Rate	578	0	Rate	0	/sec	TR_CONGESTION	21
Server	306	pagesPagedIn	Pages Paged In	Pages Paged In	136	5	Per Second	1		DLL_FRAMES	1
Server	306	pagesPagedOut	Pages Paged Out	Pages Paged Out	137	5	Per Second	1		DLL_MCASTS	3
Server	306	pagesSwappedIn	Pages Swapped In	Pages Swd In	138	5	Per Second	1		DLL_BCASTS	4
Server	306	pagesSwappedOut	Pages Swapped Out	Pages Swd Out	139	5	Per Second	1		DLL_RCV_OFF_FRAMES	5
Server	306	physicalMemoryFree	Physical Memory Free	Phys Memory Free	599	7	Bytes	4	(bytes)	(DLL_ENET_FRAMES-DLL_COLLISIONS)	216
Server	306	physicalMemoryUsed	Physical Memory Used	Physical Memory	145	7	Bytes	4	(bytes)	DLL_COLLISIONS	9
Server	306	physicalMemoryUtilization	Physical Memory Utilization	Physical Memory	160	4	Percent	1	%	100.0*DELTA_TIME*DLL_COLLISIONS/DLL_ENET_FRAMES	68
Server	306	processes	Processes	Processes	576	19	Size	4		TR_TOKEN	23
Server	306	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Server	306	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Server	306	smallCommBuffersDropped	Small Comm Buffers Dropped	Small Comm Buff	165	5	Per Second	1		TR_INTERNAL	18
Server	306	systemCalls	System Calls	System Calls	579	0	Rate	0	/sec	TR_LOST_FRAME	22
Server	306	totalBytes	Total Bytes	Total Bytes	140	1	Bytes	0	/sec	BYTES_IN+BYTES_OUT	85
Server	306	totalCommFault	Total Comm Error	Total Comm Error	163	5	Per Second	1		TR_FREQUENCY*TR_FRAME_COPIED	61
Server	306	totalCpuUtilization	Total CPU Util	Total CPU Util	597	4	Percent	1	%	TR_LLC_FRAMES	26
Server	306	totalFramesDiscarded	Total Frames Discarded	Ttl Frms Discard	126	2	Frames	0	/sec	TR_FRAME_COPIED	25
Server	306	totalIncomingBytes	Total Incoming Bytes	Total In Bytes	78	1	Bytes	0	/sec	BYTES_IN	28
Server	306	totalIncomingPackets	Total Incoming Pkts	Total In Pkts	77	2	Frames	0	/sec	PACKETS_IN	27
Server	306	totalLargeCommBuffers	Total Large Comm Buffers	Ttl Lrge Com Buf	166	5	Per Second	1		TR_ABORT	19
Server	306	totalOutgoingBytes	Total Outgoing Bytes	Ttl Out Bytes	80	1	Bytes	0	/sec	BYTES_OUT	30
Server	306	totalOutgoingPackets	Total Outgoing Pkts	Ttl Out Pkts	79	2	Frames	0	/sec	PACKETS_OUT	29
Server	306	totalPhysicalMemory	Total Physical Memory	Total Phys Mem	144	7	Bytes	4	(bytes)	DLL_ENET_FRAMES	8
Server	306	totalVirtualMemory	Total Virtual Memory	Total Vir Mem	149	7	Bytes	4	(bytes)	TR_LINE	16
Server	306	users	Users	Users	598	19	Size	4		TR_BIT_STREAMING	14
Server	306	virtualMemoryFree	Virtual Memory Free	Virt Memory Free	600	7	Bytes	4	(bytes)	(TR_LINE-TR_BURST)	217
Server	306	virtualMemoryUsed	Virtual Memory Used	Vir Mem Used	150	7	Bytes	4	(bytes)	TR_BURST	17
Server	306	virtualMemoryUtilization	Virtual Memory Utilization	Virt Mem Util	161	4	Percent	1	%	100.0*DELTA_TIME*TR_BURST/TR_LINE	69
Server CPU	330	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Server CPU	330	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Server CPU	330	cpuIdleUtilization	CPU Idle Utilization	CPU Idle Util	572	4	Percent	1	%	BYTES_IN	28
Server CPU	330	cpuSystemUtilization	CPU System Utilization	CPU System Util	583	4	Percent	1	%	TR_LLC_FRAMES	26
Server CPU	330	cpuUserUtilization	CPU User Utilization	CPU User Util	592	4	Percent	1	%	TR_FRAME_COPIED	25
Server CPU	330	cpuUtilization	CPU Utilization	CPU Utilization	128	4	Percent	1	%	TR_FREQUENCY	65
Server CPU	330	cpuWaitUtilization	CPU Wait Utilization	CPU Wait Util	584	4	Percent	1	%	PACKETS_IN	27
Server CPU	330	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57

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label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Server CPU	330	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Server CPU	330	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	68
Server CPU	330	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Server CPU	330	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
User Partition	350	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
User Partition	350	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
User Partition	350	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	67
User Partition	350	InodeUtilization	Inode Util	Inode Util	581	4	Percent	1	%	DLL_FRAMES	1
User Partition	350	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
User Partition	350	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	68
User Partition	350	partitionAllocationFailures	Partition Allocation Failures	Part Alloc Fails	157	5	Per Second	1		PACKETS_IN	27
User Partition	350	partitionReads	Partition Reads	Part Reads	154	0	Rate	0	/sec	BYTES_IN	29
User Partition	350	PartitionReads&Writes	Partition Reads&Writes	Part Reads&Wrts	156	0	Rate	0	/sec	BYTES_OUT	30
User Partition	350	partitionStorageCapacity	Partition Storage Capacity	Part Stor Cap	152	7	Bytes	4	(bytes)	TR_FREQUENCY	24
User Partition	350	partitionStorageFree	Partition Storage Free	Part Stor Free	601	7	Bytes	4	(bytes)	(TR_FREQUENCY-TR_FRAME_COPIED)	218
User Partition	350	partitionStorageUsed	Partition Storage Used	Part Stor Used	151	7	Bytes	4	(bytes)	TR_FRAME_COPIED	25
User Partition	350	partitionUtilization	Partition Utilization	Part Util	153	4	Percent	1	%	100.0*DELTA_TIME*TR_FRAME_COPIED/TR_FREQUENCY	62
User Partition	350	partitionWrites	Partition Writes	Part Writes	155	0	Rate	0	/sec	PACKETS_OUT	28
User Partition	350	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
User Partition	350	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
BMC NT Partition	352	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
BMC NT Partition	352	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
BMC NT Partition	352	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	67
BMC NT Partition	352	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
BMC NT Partition	352	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	68
BMC NT Partition	352	partitionStorageCapacity	Partition Storage Capacity	Part Stor Cap	152	7	Bytes	4	(bytes)	TR_FREQUENCY	24
BMC NT Partition	352	partitionStorageUsed	Partition Storage Used	Part Stor Used	151	7	Bytes	4	(bytes)	TR_FRAME_COPIED	25
BMC NT Partition	352	partitionUtilization	Partition Utilization	Part Util	153	4	Percent	1	%	100.0*DELTA_TIME*TR_FRAME_COPIED/TR_FREQUENCY	62
BMC NT Partition	352	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
BMC NT Partition	352	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
BMC UNIX Partition	353	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
BMC UNIX Partition	353	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
BMC UNIX Partition	353	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	67
BMC UNIX Partition	353	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
BMC UNIX Partition	353	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	68
BMC UNIX Partition	353	partitionStorageCapacity	Partition Storage Capacity	Part Stor Cap	152	7	Bytes	4	(bytes)	TR_FREQUENCY	24
BMC UNIX Partition	353	partitionStorageUsed	Partition Storage Used	Part Stor Used	151	7	Bytes	4	(bytes)	TR_FRAME_COPIED	25
BMC UNIX Partition	353	partitionUtilization	Partition Utilization	Part Util	153	4	Percent	1	%	100.0*DELTA_TIME*TR_FRAME_COPIED/TR_FREQUENCY	62
BMC UNIX Partition	353	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76

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label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
BMC UNIX Partition	353	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Disk	370	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Disk	370	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Disk	370	diskAvgTransferSize	Average Transfer Size	Avg Xfer Size	714	1	Bytes	0	/sec	DELTA_TIME*DLL_BYTES/BYTES_OUT	309
Disk	370	diskAvgTransferTime	Average Transfer Time	Avg Xfer Time	715	13	Gauge	1		1000.0*DELTA_TIME*DLL_MCASTS/BYTES_OUT	303
Disk	370	diskBusyTime	Disk I/O Busy Utilization	Disk Busy Time	567	4	Percent	1	%	100.0*DLL_MCASTS	317
Disk	370	diskBytesTransferred	Bytes Transferred	Bytes Xferd	703	1	Bytes	0	/sec	DLL_BYTES	2
Disk	370	diskFaults	Disk Faults	Disk Faults	135	5	Per Second	1		PACKETS_IN	27
Disk	370	diskQueueLength	Disk I/O Queue Length	Disk Q Length	568	0	Rate	0	/sec	DLL_BCASTS	4
Disk	370	diskReads	Disk Reads	Disk Reads	132	0	Rate	0	/sec	BYTES_IN	28
Disk	370	diskReadsWrites	Disk Reads&Writes	Disk Read&Write	134	0	Rate	0	/sec	BYTES_OUT	30
Disk	370	diskStorageCapacity	Disk Storage Capacity	Disk Stor Cap	130	7	Bytes	4	(bytes)	TR_FREQUENCY	24
Disk	370	diskStorageFree	Storage Free	Storage Free	709	7	Bytes	4	(bytes)	TR_FREQUENCY-TR_FRAME_COPIED	61
Disk	370	diskStorageUsed	Storage Used	Storage Used	710	7	Bytes	4	(bytes)	TR_FRAME_COPIED	25
Disk	370	diskStorageUtilization	Disk Storage Utilization	Disk Stor Util	131	4	Percent	1	%	100.0*DELTA_TIME*TR_FRAME_COPIED/TR_FREQUENCY	62
Disk	370	diskWrites	Disk Writes	Disk Writes	133	0	Rate	0	/sec	PACKETS_OUT	29
Disk	370	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Disk	370	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Disk	370	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Disk	370	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Disk	370	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Disk	371	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Disk	371	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Disk	371	diskReadsWrites	Disk Reads&Writes	Disk Read&Write	134	0	Rate	0	/sec	BYTES_OUT	30
Disk	371	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Disk	371	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Disk	371	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Disk	371	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Disk	371	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Server LAN	502	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Server LAN	502	avgFrameSize	Average Frame Size	Avg Frame Size	700	7	Bytes	4	(bytes)	DELTA_TIME*TR_TOKEN/TR_LOST_FRAME	311
Server LAN	502	avgFrameSizeIn	Average Frame Size In	Avg Frame Sz In	701	7	Bytes	4	(bytes)	DELTA_TIME*DLL_BYTES/DLL_FRAMES	310
Server LAN	502	avgFrameSizeOut	Average Frame Size Out	Avg Frame Sz Out	702	7	Bytes	4	(bytes)	DELTA_TIME*(TR_TOKEN-DLL_BYTES)/(TR_LOST_FRAME-DLL_FRAMES)	306
Server LAN	502	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Server LAN	502	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent	1	%	((TR_TOKEN*8*100.0)/$(speed))	87
Server LAN	502	bandwidthIn	Bandwidth Utilization In	BW Util In	210	4	Percent	1	%	((DLL_BYTES*8*100.0)/$(speedIn))	78
Server LAN	502	bandwidthOut	Bandwidth Utilization Out	BW Util Out	211	4	Percent	1	%	(((TR_TOKEN-DLL_BYTES)*8*100.0)/$(speedOut))	80
Server LAN	502	bits	Bits	Bits	437	15	Bits	0	/sec	(TR_TOKEN*8.0)	161
Server LAN	502	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(DLL_BYTES*8.0)	160
Server LAN	502	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	((TR_TOKEN-DLL_BYTES)*8.0)	166
Server LAN	502	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	TR_TOKEN	23
Server LAN	502	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_BYTES	2
Server LAN	502	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	(TR_TOKEN-DLL_BYTES)	74
Server LAN	502	collisionsOutPct	Collisions (out) %	Collisions Out %	720	4	Percent	1	%	100.0*DELTA_TIME*DLL_RCV_OFF_FRAMES/(TR_LOST_FRAME-DLL_FRAMES)	327

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Server LAN	502	discardedFrames	Discarded Frames	Discarded Frames	57	2	Frames		0 /sec	TR_FRAME_COPIED	25
Server LAN	502	discardsIn	Discards In	Discards In	196	2	Frames		0 /sec	DLL_COLLISIONS	9
Server LAN	502	discardsInPct	Discards In %	Discards In %	528	4	Percent		1 %	100.0*DELTA_TIME*DLL_COLLISIONS/DLL_FRAMES	191
Server LAN	502	discardsOut	Discards Out	Discards Out	197	2	Frames		0 /sec	(TR_FRAME_COPIED-DLL_COLLISIONS)	83
Server LAN	502	discardsOutPct	Discards Out %	Discards Out %	531	4	Percent		1 %	100.0*DELTA_TIME*(TR_FRAME_COPIED-DLL_COLLISIONS)/(TR_LOST_FRAME-DLL_FRAMES)	193
Server LAN	502	errors	Errors	Errors	7	2	Frames		0 /sec	TR_FREQUENCY	24
Server LAN	502	errorsIn	Errors In	Errors In	213	2	Frames		0 /sec	DLL_ERRORS	10
Server LAN	502	errorsInPct	Errors In %	Errors In %	530	4	Percent		1 %	100.0*DELTA_TIME*DLL_ERRORS/DLL_FRAMES	192
Server LAN	502	errorsOut	Errors Out	Errors Out	212	2	Frames		0 /sec	TR_FREQUENCY-DLL_ERRORS	64
Server LAN	502	errorsOutPct	Errors Out %	Errors Out %	532	4	Percent		1 %	100.0*DELTA_TIME*(TR_FREQUENCY-DLL_ERRORS)/(TR_LOST_FRAME-DLL_FRAMES)	194
Server LAN	502	frames	Frames	Frames	1	2	Frames		0 /sec	TR_LOST_FRAME	22
Server LAN	502	framesIn	Frames In	Frames In	28	2	Frames		0 /sec	DLL_FRAMES	1
Server LAN	502	framesOut	Frames Out	Frames Out	29	2	Frames		0 /sec	(TR_LOST_FRAME-DLL_FRAMES)	82
Server LAN	502	goodPolls	Good Polls	Good Polls	118	4	Percent		1 %	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	67
Server LAN	502	latency	Latency	Latency	208	11	Milliseconds		1 (msec)	LATENCY	81
Server LAN	502	missedPolls	Missed Polls	Missed Polls	119	4	Percent		1 %	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Server LAN	502	nonUnicast	Nonunicast	Nonunicast	55	2	Frames		0 /sec	DLL_BCASTS	4
Server LAN	502	nonUnicastIn	Nonunicast In	Nonunicast In	198	2	Frames		0 /sec	DLL_MCASTS	3
Server LAN	502	nonUnicastOut	Nonunicast Out	Nonunicast Out	199	2	Frames		0 /sec	(DLL_BCASTS-DLL_MCASTS)	R4
Server LAN	502	reachability	Reachability	Reachability	182	10	Total Time		1 (%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Server LAN	502	reboots	Reboots	Reboots	121	4	Percent		1 %	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Server LAN	502	unknownProtocolPackets	Unknown Protocol Pkts	Unkn Proto Pkts	104	2	Frames		0 /sec	TR_LINE	10
Server LAN	504	availability	Availability	Availability	181	10	Total Time		1 (%)	(AVAILABLE_TIME*100.0)	77
Server LAN	504	avgFrameSize	Average Frame Size	Avg Frame Size	700	7	Bytes		4 (bytes)	DELTA_TIME*TR_TOKEN/TR_LOST_FRAME	311
Server LAN	504	avgFrameSizeIn	Average Frame Size In	Avg Frame Sz In	701	7	Bytes		4 (bytes)	DELTA_TIME*DLL_BYTES/DLL_FRAMES	310
Server LAN	504	avgFrameSizeOut	Average Frame Size Out	Avg Frame Sz Out	702	7	Bytes		4 (bytes)	DELTA_TIME*(TR_TOKEN-DLL_BYTES)/(TR_LOST_FRAME-DLL_FRAMES)	306
Server LAN	504	badPolls	Bad Polls	Bad Polls	120	4	Percent		1 %	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Server LAN	504	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent		1 %	((TR_TOKEN*8*100.0)/$(speedTotal))	79
Server LAN	504	bandwidthIn	Bandwidth Utilization In	BW Util In	210	4	Percent		1 %	((DLL_BYTES*8*100.0)/$(speedIn))	78
Server LAN	504	bandwidthOut	Bandwidth Utilization Out	BW Util Out	211	4	Percent		1 %	(((TR_TOKEN-DLL_BYTES)*8*100.0)/$(speedOut))	80
Server LAN	504	bits	Bits	Bits	437	15	Bits		0 /sec	(TR_TOKEN*8.0)	161
Server LAN	504	bitsIn	Bits In	Bits In	438	15	Bits		0 /sec	(DLL_BYTES*8.0)	160
Server LAN	504	bitsOut	Bits Out	Bits Out	439	15	Bits		0 /sec	((TR_TOKEN-DLL_BYTES)*8.0)	166
Server LAN	504	bytes	Bytes	Bytes	2	1	Bytes		0 /sec	TR_TOKEN	23
Server LAN	504	bytesIn	Bytes In	Bytes In	18	1	Bytes		0 /sec	DLL_BYTES	2
Server LAN	504	bytesOut	Bytes Out	Bytes Out	20	1	Bytes		0 /sec	(TR_TOKEN-DLL_BYTES)	74
Server LAN	504	[illegible]	[illegible]	[illegible]	720	4	Percent		1 %	100.0*DELTA_TIME*DLL_RCV_OFF_FRAMES/(TR_LOST_FRAME-DLL_FRAMES)	327
Server LAN	504	[illegible]	[illegible]	[illegible]	57	2	Frames		0 /sec	TR_FRAME_COPIED	25
Server LAN	504	[illegible]	[illegible]	[illegible]	196	2	Frames		0 /sec	DLL_COLLISIONS	9
Server LAN	504	[illegible]	[illegible]	[illegible]	529	4	Percent		1 %	100.0*DELTA_TIME*DLL_COLLISIONS/DLL_FRAMES	191
Server LAN	504	[illegible]	[illegible]	[illegible]	197	2	Frames		0 /sec	(TR_FRAME_COPIED-DLL_COLLISIONS)	83
Server LAN	504	discardsOutPct	Discards Out %	Discards Out %	531	4	Percent		1 %	100.0*DELTA_TIME*(TR_FRAME_COPIED-DLL_COLLISIONS)/(TR_LOST_FRAME-DLL_FRAMES)	193
Server LAN	504	errors	Errors	Errors	7	2	Frames		0 /sec	TR_FREQUENCY	24
Server LAN	504	errorsIn	Errors In	Errors In	213	2	Frames		0 /sec	DLL_ERRORS	10
Server LAN	504	errorsInPct	Errors In %	Errors In %	530	4	Percent		1 %	100.0*DELTA_TIME*DLL_ERRORS/DLL_FRAMES	192
Server LAN	504	errorsOut	Errors Out	Errors Out	212	2	Frames		0 /sec	TR_FREQUENCY-DLL_ERRORS	64
Server LAN	504	errorsOutPct	Errors Out %	Errors Out %	532	4	Percent		1 %	100.0*DELTA_TIME*(TR_FREQUENCY-DLL_ERRORS)/(TR_LOST_FRAME-DLL_FRAMES)	194
Server LAN	504	frames	Frames	Frames	1	2	Frames		0 /sec	TR_LOST_FRAME	22

Appendix A

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Server LAN	504	framesIn	Frames In	Frames In	28	2	Frames	0	/sec	DLL_FRAMES	1
Server LAN	504	framesOut	Frames Out	Frames Out	29	2	Frames	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)	82
Server LAN	504	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Server LAN	504	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Server LAN	504	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Server LAN	504	nonUnicast	Nonunicast	Nonunicast	56	2	Frames	0	/sec	DLL_BCASTS	4
Server LAN	504	nonUnicastIn	Nonunicast In	Nonunicast In	198	2	Frames	0	/sec	DLL_MCASTS	3
Server LAN	504	nonUnicastOut	Nonunicast Out	Nonunicast Out	199	2	Frames	0	/sec	(DLL_BCASTS-DLL_MCASTS)	84
Server LAN	504	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Server LAN	504	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Server LAN	504	unknownProtocolPackets	Unknown Protocol Pkts	Unkn Proto Pkts	104	2	Frames	0	/sec	TR_LINE	16
Server WAN	600	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Server WAN	600	avgFrameSize	Average Frame Size	Avg Frame Size	700	7	Bytes	4	(bytes)	DELTA_TIME*TR_TOKEN/TR_LOST_FRAME	311
Server WAN	600	avgFrameSizeIn	Average Frame Size In	Avg Frame Sz In	701	7	Bytes	4	(bytes)	DELTA_TIME*DLL_BYTES/DLL_FRAMES	310
Server WAN	600	avgFrameSizeOut	Average Frame Size Out	Avg Frame Sz Out	702	7	Bytes	4	(bytes)	DELTA_TIME*(TR_TOKEN-DLL_BYTES)/(TR_LOST_FRAME-DLL_FRAMES)	306
Server WAN	600	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Server WAN	600	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent	1	%	((TR_TOKEN*8*100.0)/$(speedTotal))	79
Server WAN	600	bandwidthIn	Bandwidth Utilization In	BW Util In	210	4	Percent	1	%	((DLL_BYTES*8*100.0)/$(speedIn))	78
Server WAN	600	bandwidthOut	Bandwidth Utilization Out	BW Util Out	211	4	Percent	1	%	(((TR_TOKEN-DLL_BYTES)*8*100.0)/$(speedOut))	80
Server WAN	600	bits	Bits	Bits	437	15	Bits	0	/sec	(TR_TOKEN*8.0)	161
Server WAN	600	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(DLL_BYTES*8.0)	160
Server WAN	600	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	((TR_TOKEN-DLL_BYTES)*8.0)	166
Server WAN	600	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	TR_TOKEN	23
Server WAN	600	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_BYTES	2
Server WAN	600	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	(TR_TOKEN-DLL_BYTES)	74
Server WAN	600	discardedFrames	Discarded Frames	Discarded Frames	57	2	Frames	0	/sec	TR_FRAME_COPIED	25
Server WAN	600	discardsIn	Discards In	Discards In	196	2	Frames	0	/sec	DLL_COLLISIONS	9
Server WAN	600	discardsInPct	Discards In %	Discards In %	529	4	Percent	1	%	100.0*DELTA_TIME*DLL_COLLISIONS/DLL_FRAMES	191
Server WAN	600	discardsOut	Discards Out	Discards Out	197	2	Frames	0	/sec	(TR_FRAME_COPIED-DLL_COLLISIONS)	83
Server WAN	600	discardsOutPct	Discards Out %	Discards Out %	531	4	Percent	1	%	100.0*DELTA_TIME*(TR_FRAME_COPIED-DLL_COLLISIONS)/(TR_LOST_FRAME-DLL_FRAMES)	193
Server WAN	600	errors	Errors	Errors	7	2	Frames	0	/sec	TR_FREQUENCY	24
Server WAN	600	errorsIn	Errors In	Errors In	213	2	Frames	0	/sec	DLL_ERRORS	10
Server WAN	600	errorsInPct	Errors In %	Errors In %	530	4	Percent	1	%	100.0*DELTA_TIME*DLL_ERRORS/DLL_FRAMES	192
Server WAN	600	errorsOut	Errors Out	Errors Out	212	2	Frames	0	/sec	TR_FREQUENCY-DLL_ERRORS	64
Server WAN	600	errorsOutPct	Errors Out %	Errors Out %	532	4	Percent	1	%	100.0*DELTA_TIME*(TR_FREQUENCY-DLL_ERRORS)/(TR_LOST_FRAME-DLL_FRAMES)	194
Server WAN	600	frames	Frames	Frames	1	2	Frames	0	/sec	TR_LOST_FRAME	22
Server WAN	600	framesIn	Frames In	Frames In	28	2	Frames	0	/sec	DLL_FRAMES	1
Server WAN	600	framesOut	Frames Out	Frames Out	29	2	Frames	0	/sec	(TR_LOST_FRAME-DLL_FRAMES)	82
Server WAN	600	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Server WAN	600	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Server WAN	600	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Server WAN	600	nonUnicast	Nonunicast	Nonunicast	56	2	Frames	0	/sec	DLL_BCASTS	4
Server WAN	600	nonUnicastIn	Nonunicast In	Nonunicast In	198	2	Frames	0	/sec	DLL_MCASTS	3
Server WAN	600	nonUnicastOut	Nonunicast Out	Nonunicast Out	199	2	Frames	0	/sec	(DLL_BCASTS-DLL_MCASTS)	84
Server WAN	600	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Server WAN	600	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Server WAN	600	unknownProtocolPackets	Unknown Protocol Pkts	Unkn Proto Pkts	104	2	Frames	0	/sec	TR_LINE	16

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label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Modem	700	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Modem	700	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Modem	700	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent	1	%	100.0*((DLL_TRANSITS+DLL_ENET_FRAMES)*8.0*DELTA_TIME/DLL_BYTES)/((TR_SET_RECOVERY_MODE+DLL_ALGN_ERRORS)/DELTA_TIME)	124
Modem	700	bandwidthIn	Bandwidth Utilization In	BW Util In	210	4	Percent	1	%	100.0*((DLL_ENET_FRAMES*8.0*DELTA_TIME/DLL_BYTES)/(TR_SET_RECOVERY_MODE/DELTA_TIME)	125
Modem	700	bandwidthOut	Bandwidth Utilization Out	BW Util Out	211	4	Percent	1	%	100.0*((DLL_TRANSITS*8.0*DELTA_TIME/DLL_BYTES)/(DLL_ALGN_ERRORS/DELTA_TIME)	126
Modem	700	bits	Bits	Bits	437	15	Bits	0	/sec	((DLL_TRANSITS+DLL_ENET_FRAMES)*8.0)	163
Modem	700	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(DLL_ENET_FRAMES*8.0)	165
Modem	700	bitsInPerCallSecond	Bits In/Call Sec	Bits In/Call Soc	402	13	Gauge	1		DLL_ENET_FRAMES*8.0*DELTA_TIME/DLL_BYTES	122
Modem	700	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	((DLL_TRANSITS*8.0)	166
Modem	700	bitsOutPerCallSecond	Bits Out Per Call Second	Bits Out/Call Soc	403	13	Gauge	1		DLL_TRANSITS*8.0*DELTA_TIME/DLL_BYTES	123
Modem	700	bitsPerCallSecond	Bits Per Call Second	Bits/Call Soc	401	13	Gauge	1		((DLL_TRANSITS+DLL_ENET_FRAMES)*8.0*DELTA_TIME/DLL_BYTES	121
Modem	700	busyTime	Busied Out Time	Busied Out	378	4	Percent	1	%	100.0*TR_FRAME_COPIED	106
Modem	700	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	DLL_TRANSITS+DLL_ENET_FRAMES	31
Modem	700	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_ENET_FRAMES	6
Modem	700	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	DLL_TRANSITS	7
Modem	700	callRcvRate	Speed In	Speed In	324	0	Rate	0	/sec	TR_SET_RECOVERY_MODE	12
Modem	700	callXmtRate	Speed Out	Speed Out	323	0	Rate	0	/sec	DLL_ALGN_ERRORS	11
Modem	700	connectErrors	Connect Errors	Connect Errors	314	0	Rate	0	/sec	DLL_MCASTS	3
Modem	700	connections	Connections	Connections	317	0	Rate	0	/sec	TR_LINE	16
Modem	700	connectTime	Connect Time	Connect Time	320	4	Percent	1	%	100.0*TR_ABORT	105
Modem	700	disabledTime	Disabled Time	Disabled Time	321	4	Percent	1	%	100.0*TR_ADDRESS_COPIED	106
Modem	700	discardedFrames	Frames Discarded	Frames Discarded	26	2	Frames	0	/sec	DLL_COLLISIONS	9
Modem	700	discardedFramesPct	Frames Discarded %	Frames Discarded %	705	4	Percent	1	%	100.0*DELTA_TIME*DLL_COLLISIONS/(TR_BIT_STREAMING+TR_CONTENTION_STREAMING)	301
Modem	700	frameErrors	Frame Errors	Frame Errors	315	2	Frames	0	/sec	DLL_ERRORS	10
Modem	700	frameErrorsPct	Frame Errors %	Frame Errors %	704	4	Percent	1	%	100.0*DELTA_TIME*DLL_ERRORS/(TR_BIT_STREAMING+TR_CONTENTION_STREAMING)	302
Modem	700	frames	Frames	Frames	1	2	Frames	0	/sec	TR_BIT_STREAMING+TR_CONTENTION_STREAMING	97
Modem	700	framesIn	Frames In	Frames In	28	2	Frames	0	/sec	TR_BIT_STREAMING	14
Modem	700	framesOut	Frames Out	Frames Out	29	2	Frames	0	/sec	TR_CONTENTION_STREAMING	15
Modem	700	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Modem	700	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	61
Modem	700	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Modem	700	modemBusyTime	Modem Busy Time	Modem Busy Time	395	4	Percent	1	%	100.0*TR_INTERNAL+TR_ABORT+TR_ADDRESS_COPIED+TR_CONGESTION+TR_FRAME_COPIED+TR_LLC_FRAMES)	118
Modem	700	modemErrors	Modem Errors	Modem Errors	351	0	Rate	0	/sec	DLL_MCASTS+DLL_XMT_OFF_FRAMES	102
Modem	700	offhookTime	Off Hook Time	Off Hook Time	319	4	Percent	1	%	100.0*TR_INTERNAL	104
Modem	700	onhookTime	On Hook Time	On Hook Time	318	4	Percent	1	%	100.0*TR_BURST	103
Modem	700	otherErrors	Other Errors	Other Errors	352	0	Rate	0	/sec	DLL_XMT_OFF_FRAMES	6
Modem	700	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
Modem	700	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Modem	700	retrains	Retrains	Retrains	316	12	Per Call Minute	1	(/Call Min)	TR_SIGNAL_LOSS*60.0*DELTA_TIME/DLL_BYTES	101
Modem	700	testTime	Test Time	Test Time	379	4	Percent	1	%	100.0*TR_LLC_FRAMES	109
Modem	700	unknownTime	Unknown Time	Unknown Time	322	4	Percent	1	%	100.0*TR_CONGESTION	107
ISDN Interface	701	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
ISDN Interface	701	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59

Appendix A

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
ISDN Interface	701	bandwidth	Bandwidth Utilization	BW Util	209	4	Percent	1	%	100.0*((DLL_TRANSITS*DLL_ENET_FRAMES)*8.0*DELTA_TIME/DLL_BYTES))/((TR_SET_RECOVERY_MODE*DLL_ALGN_ERRORS)/DELTA_TIME)	124
ISDN Interface	701	bandwidthIn	Bandwidth Utilization In	BW Util In	210	4	Percent	1	%	100.0*((DLL_ENET_FRAMES*8.0*DELTA_TIME/DLL_BYTES)/(TR_SET_RECOVERY_MODE/DELTA_TIME)	125
ISDN Interface	701	bandwidthOut	Bandwidth Utilization Out	BW Util Out	211	4	Percent	1	%	100.0*((DLL_TRANSITS*8.0*DELTA_TIME/DLL_BYTES)/(DLL_ALGN_ERRORS/DELTA_TIME)	126
ISDN Interface	701	bits	Bits	Bits	437	15	Bits	0	/sec	((DLL_TRANSITS+DLL_ENET_FRAMES)*8.0)	163
ISDN Interface	701	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(DLL_ENET_FRAMES*8.0)	165
ISDN Interface	701	bitsInPerCallSecond	Bits In Per Call Second	Bits In/Call Sec	402	13	Gauge	1		DLL_ENET_FRAMES*8.0*DELTA_TIME/DLL_BYTES	122
ISDN Interface	701	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	(DLL_TRANSITS*8.0)	166
ISDN Interface	701	bitsOutPerCallSecond	Bits Out Per Call Second	Bits Out/Call Sec	403	13	Gauge	1		DLL_TRANSITS*8.0*DELTA_TIME/DLL_BYTES	123
ISDN Interface	701	bitsPerCallSecond	Bits Per Call Second	Bits/Call Sec	401	13	Gauge	1		(DLL_TRANSITS+DLL_ENET_FRAMES)*8.0*DELTA_TIME/DLL_BYTES	121
ISDN Interface	701	busyTime	Busied Out Time	Busied Out	378	4	Percent	1	%	100.0*TR_FRAME_COPIED	108
ISDN Interface	701	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	DLL_TRANSITS+DLL_ENET_FRAMES	31
ISDN Interface	701	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_ENET_FRAMES	8
ISDN Interface	701	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	DLL_TRANSITS	7
ISDN Interface	701	callRcvRate	Speed In	Speed In	324	0	Rate	0	/sec	TR_SET_RECOVERY_MODE	12
ISDN Interface	701	callXmitRate	Speed Out	Speed Out	323	0	Rate	0	/sec	DLL_ALGN_ERRORS	11
ISDN Interface	701	connectErrors	Connect Errors	Connect Errors	314	0	Rate	0	/sec	DLL_MCASTS	3
ISDN Interface	701	connections	Connections	Connections	317	0	Rate	0	/sec	TR_LINE	16
ISDN Interface	701	connectTime	Connect Time	Connect Time	320	4	Percent	1	%	100.0*TR_ABORT	105
ISDN Interface	701	disabledTime	Disabled Time	Disabled Time	321	4	Percent	1	%	100.0*TR_ADDRESS_COPIED	106
ISDN Interface	701	discardedFrames	Frames Discarded	Frames Discarded	26	2	Frames	0	/sec	DLL_COLLISIONS	9
ISDN Interface	701	discardedFramesPct	Frames Discarded %	Frames Discrded %	705	4	Percent	1	%	100.0*DELTA_TIME*DLL_COLLISIONS/(TR_BIT_STREAMING+TR_CONTENTION_STREAMING)	301
ISDN Interface	701	frameErrors	Frame Errors	Frame Errors	315	2	Frames	0	/sec	DLL_ERRORS	10
ISDN Interface	701	frameErrorsPct	Frame Errors %	Frame Errors %	704	4	Percent	1	%	100.0*DELTA_TIME*DLL_ERRORS/(TR_BIT_STREAMING+TR_CONTENTION_STREAMING)	302
ISDN Interface	701	frames	Frames	Frames	1	2	Frames	0	/sec	TR_BIT_STREAMING+TR_CONTENTION_STREAMING	97
ISDN Interface	701	framesIn	Frames In	Frames In	28	2	Frames	0	/sec	TR_BIT_STREAMING	14
ISDN Interface	701	framesOut	Frames Out	Frames Out	29	2	Frames	0	/sec	TR_CONTENTION_STREAMING	15
ISDN Interface	701	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	67
ISDN Interface	701	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
ISDN Interface	701	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
ISDN Interface	701	[illegible]	[illegible]	Modem Busy Time	395	4	Percent	1	%	100.0*TR_INTERNAL+TR_ABORT+TR_ADDRESS_COPIED+TR_CONGESTION+TR_FRAME_COPIED+TR_LLC_FRAMES)	118
ISDN Interface	701	[illegible]	[illegible]	Modem Error	351	0	Rate	0	/sec	DLL_MCASTS+DLL_XMT_OFF_FRAMES	102
ISDN Interface	701	[illegible]	[illegible]	CM Hook Time	319	4	Percent	1	%	100.0*TR_INTERNAL	104
ISDN Interface	701	[illegible]	[illegible]	On Hook Time	318	4	Percent	1	%	100.0*TR_BURST	103
ISDN Interface	701	[illegible]	[illegible]	Client Error	352	0	Rate	0	/sec	DLL_XMT_OFF_FRAMES	6
ISDN Interface	701	[illegible]	[illegible]	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
ISDN Interface	701	[illegible]	[illegible]	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
ISDN Interface	701	[illegible]	[illegible]	Test Time	379	4	Percent	1	%	100.0*TR_LLC_FRAMES	109
ISDN Interface	701	[illegible]	[illegible]	Unknown Time	322	4	Percent	1	%	100.0*TR_CONGESTION	107
ISDN Interface	701	[illegible]	[illegible]	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	77
Remote Access Server	725	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Remote Access Server	725	bits	Bits	Bits	437	15	Bits	0	/sec	((DLL_TRANSITS+DLL_ENET_FRAMES)*8.0)	163
Remote Access Server	725	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(DLL_ENET_FRAMES*8.0)	165
Remote Access Server	725	bitsInPerCallSecond	Bits In Per Call Second	Bits In/Call Sec	402	13	Gauge	1		DLL_ENET_FRAMES*8.0*DELTA_TIME/DLL_BYTES	122
Remote Access Server	725	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	(DLL_TRANSITS*8.0)	166
Remote Access Server	725	bitsOutPerCallSecond	Bits Out Per Call Second	Bits Out/Call Sec	403	13	Gauge	1		DLL_TRANSITS*8.0*DELTA_TIME/DLL_BYTES	123

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label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Remote Access Server	725	bitsPerCallSecond	Bits Per Call Second	Bits/Call Sec	401	13	Gauge	1		(DLL_TRANSITS+DLL_ENET_FRAMES)*8.0*DELTA_TIME/D LL_BYTES	121
Remote Access Server	725	busyTime	RAS Busted Out Time	RAS Busted Out	393	4	Percent	1	%	100.0*TR_FRAME_COPIED*DELTA_TIME/TR_LOST_FRAME	115
Remote Access Server	725	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	DLL_TRANSITS+DLL_ENET_FRAMES	31
Remote Access Server	725	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_ENET_FRAMES	8
Remote Access Server	725	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	DLL_TRANSITS	7
Remote Access Server	725	connectErrors	Connect Errors	Connect Errors	314	0	Rate	0	/sec	DLL_MCASTS	3
Remote Access Server	725	connections	Connections	Connections	317	0	Rate	0	/sec	TR_LINE	16
Remote Access Server	725	connectTime	RAS Connect Time	RAS Connect Time	390	4	Percent	1	%	100.0*TR_ABORT*DELTA_TIME/TR_LOST_FRAME	112
Remote Access Server	725	cpuUtilization	CPU Utilization	CPU Utilization	91	4	Percent	1	%	DLL_BCASTS	4
Remote Access Server	725	disabledTime	RAS Disbld Time	RAS Disbld Time	391	4	Percent	1	%	100.0*TR_ADDRESS_COPIED*DELTA_TIME/TR_LOST_FRA ME	113
Remote Access Server	725	discardedFrames	Frames Discarded	Frames Discarded	26	2	Frames	0	/sec	DLL_COLLISIONS	9
Remote Access Server	725	discardedFramesPct	Frames Discrded %	Frames Discrded %	705	4	Percent	1	%	100.0*DELTA_TIME*DLL_COLLISIONS/(TR_BIT_STREAMIN G+TR_CONTENTION_STREAMING)	301
Remote Access Server	725	frameErrors	Frame Errors	Frame Errors	315	2	Frames	0	/sec	DLL_ERRORS	10
Remote Access Server	725	frameErrorsPct	Frame Errors %	Frame Errors %	704	4	Percent	1	%	100.0*DELTA_TIME*DLL_ERRORS/(TR_BIT_STREAMING+T R_CONTENTION_STREAMING)	302
Remote Access Server	725	frames	Frames	Frames	1	2	Frames	0	/sec	TR_BIT_STREAMING+TR_CONTENTION_STREAMING	97
Remote Access Server	725	framesIn	Frames In	Frames In	28	2	Frames	0	/sec	TR_BIT_STREAMING	14
Remote Access Server	725	framesOut	Frames Out	Frames Out	29	2	Frames	0	/sec	TR_CONTENTION_STREAMING	15
Remote Access Server	725	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	('100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BA D_POLLS+REBOOTS))*DELTA_TIME	67
Remote Access Server	725	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	LATENCY	81
Remote Access Server	725	memory	Memory	Memory	376	7	Bytes	4	(bytes)	TR_SET_RECOVERY_MODE	12
Remote Access Server	725	memoryFree	Memory Free	Memory Free	706	7	Bytes	4	(bytes)	TR_SET_RECOVERY_MODE-DLL_ALGN_ERRORS	304
Remote Access Server	725	memoryUsed	Memory Used	Memory Used	375	7	Bytes	4	(bytes)	DLL_ALGN_ERRORS	11
Remote Access Server	725	memoryUtilization	Memory Util	Memory Util	168	4	Percent	1	%	100.0*DELTA_TIME*DLL_ALGN_ERRORS/TR_SET_RECOV ERY_MODE	99
Remote Access Server	725	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	('100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+B AD_POLLS+REBOOTS))*DELTA_TIME	66
Remote Access Server	725	modemBusyTime	Modem Busy Time	Modem Busy Time	395	4	Percent	1	%	100.0*TR_INTERNAL*TR_ABORT*TR_ADDRESS_COPIED +TR_CONGESTION+TR_FRAME_COPIED+TR_LLC_FRAME S)*DELTA_TIME/TR_LOST_FRAME	117
Remote Access Server	725	modemErrors	Modem Errors	Modem Errors	351	0	Rate	0	/sec	DLL_MCASTS+DLL_XMT_OFF_FRAMES	102
Remote Access Server	725	modems	Number of Modems	Nmbr of Modems	396	19	Size	4		TR_FREQUENCY	24
Remote Access Server	725	modemsBusy	Modems Busy	Modems Busy	397	19	Size	4		TR_TOKEN	23
Remote Access Server	725	modemsBusyPct	Percent Modems Busy	Pct Modems Busy	377	4	Percent	1	%	100.0*DELTA_TIME*TR_TOKEN/TR_FREQUENCY	98
Remote Access Server	725	offHookTime	RAS Off Hk Time	RAS Off Hk Time	389	4	Percent	1	%	100.0*TR_INTERNAL*DELTA_TIME/TR_LOST_FRAME	111
Remote Access Server	725	onHookTime	RAS On Hk Time	RAS On Hk Time	388	4	Percent	1	%	100.0*TR_BURST*DELTA_TIME/TR_LOST_FRAME	110
Remote Access Server	725	otherErrors	Other Errors	Other Errors	352	0	Rate	0	/sec	DLL_XMT_OFF_FRAMES	6
Remote Access Server	725	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0)) ('100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_P OLLS+REBOOTS))*DELTA_TIME	76
Remote Access Server	725	reboots	Reboots	Reboots	121	4	Percent	1	%	TR_SIGNAL_LOSS*60.0*DELTA_TIME/DLL_BYTES	60
Remote Access Server	725	retrains	Retrains	Retrains	316	12	Per Call Minute	1	(/Call Min)	TR_LLC_FRAMES*DELTA_TIME/TR_LOST_FRAME	101
Remote Access Server	725	testTime	RAS Test Time	RAS Test Time	394	4	Percent	1	%	100.0*TR_CONGESTION*DELTA_TIME/TR_LOST_FRAME	116
Remote Access Server	725	unknownTime	RAS Unknown Time	RAS Unknown Time	392	4	Percent	1	%	('100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_ POLLS+REBOOTS))*DELTA_TIME	114
RAS CPU	750	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	DLL_BCASTS	59
RAS CPU	750	cpuUtilization	CPU Utilization	CPU Utilization	91	4	Percent	1	%	('100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BA D_POLLS+REBOOTS))*DELTA_TIME	57
RAS CPU	750	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	('100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+B AD_POLLS+REBOOTS))*DELTA_TIME	58
RAS CPU	750	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	('100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_P OLLS+REBOOTS))*DELTA_TIME	60
RAS CPU	750	reboots	Reboots	Reboots	121	4	Percent	1	%		

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label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Modem Pool	775	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Modem Pool	775	bits	Bits	Bits	437	15	Bits	0	/sec	((DLL_TRANSITS+DLL_ENET_FRAMES)*8.0)	183
Modem Pool	775	bitsIn	Bits In	Bits In	438	15	Bits	0	/sec	(DLL_ENET_FRAMES*8.0)	165
Modem Pool	775	bitsInPerCallSecond	Bits In Per Call Second	Bits In/Call Sec	402	13	Gauge	1		DLL_ENET_FRAMES*8.0*DELTA_TIME/DLL_BYTES	122
Modem Pool	775	bitsOut	Bits Out	Bits Out	439	15	Bits	0	/sec	(DLL_TRANSITS*8.0)	168
Modem Pool	775	bitsOutPerCallSecond	Bits Out Per Call Second	Bits Out/Call Sec	403	13	Gauge	1		DLL_TRANSITS*8.0*DELTA_TIME/DLL_BYTES	123
Modem Pool	775	bitsPerCallSecond	Bits Per Call Second	Bits/Call Sec	401	13	Gauge	1		(DLL_TRANSITS+DLL_ENET_FRAMES)*8.0*DELTA_TIME/DLL_BYTES	121
Modem Pool	775	busyTime	Pool Busied Out Time	Pool Busied Out	386	4	Percent	1	%	100.0*TR_FRAME_COPIED*DELTA_TIME/TR_LOST_FRAME	115
Modem Pool	775	bytes	Bytes	Bytes	2	1	Bytes	0	/sec	DLL_TRANSITS+DLL_ENET_FRAMES	31
Modem Pool	775	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_ENET_FRAMES	8
Modem Pool	775	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	DLL_TRANSITS	7
Modem Pool	775	connectErrors	Connect Errors	Connect Errors	314	0	Rate	0	/sec	DLL_MCASTS	3
Modem Pool	775	connections	Connections	Connections	317	0	Rate	0	/sec	TR_LINE	16
Modem Pool	775	connectTime	Pool Connect Time	Pool Conn Time	383	4	Percent	1	%	100.0*TR_ABORT*DELTA_TIME/TR_LOST_FRAME	112
Modem Pool	775	disabledTime	Pool Disabled Time	Pool Dsbld Time	384	4	Percent	1	%	100.0*TR_ADDRESS_COPIED*DELTA_TIME/TR_LOST_FRAME	113
Modem Pool	775	discardedFrames	Frames Discarded	Frames Discarded	26	2	Frames	0	/sec	DLL_COLLISIONS	9
Modem Pool	775	discardedFramesPct	Frames Discarded %	Frames Dscrded %	705	4	Percent	1	%	100.0*DELTA_TIME*DLL_COLLISIONS/(TR_BIT_STREAMING+TR_CONTENTION_STREAMING)	301
Modem Pool	775	frameErrors	Frame Errors	Frame Errors	315	2	Frames	0	/sec	DLL_ERRORS	10
Modem Pool	775	frameErrorsPct	Frame Errors %	Frame Errors %	704	4	Percent	1	%	100.0*DELTA_TIME*DLL_ERRORS/(TR_BIT_STREAMING+TR_CONTENTION_STREAMING)	302
Modem Pool	775	frames	Frames	Frames	1	2	Frames	0	/sec	TR_BIT_STREAMING+TR_CONTENTION_STREAMING	97
Modem Pool	775	framesIn	Frames In	Frames In	28	2	Frames	0	/sec	TR_BIT_STREAMING	14
Modem Pool	775	framesOut	Frames Out	Frames Out	29	2	Frames	0	/sec	TR_CONTENTION_STREAMING	15
Modem Pool	775	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Modem Pool	775	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Modem Pool	775	modemBusyTime	Modem Busy Time	Modem Busy Time	395	4	Percent	1	%	100.0*(TR_INTERNAL+TR_ABORT+TR_ADDRESS_COPIED+TR_CONGESTION+TR_FRAME_COPIED+TR_LLC_FRAMES)*DELTA_TIME/TR_LOST_FRAME	117
Modem Pool	775	modemErrors	Modem Errors	Modem Errors	351	0	Rate	0	/sec	DLL_MCASTS+DLL_XMT_OFF_FRAMES	102
Modem Pool	775	modems	Number of Modems	Nmbr of Modems	396	19	Size	4		TR_FREQUENCY	24
Modem Pool	775	modemsBusy	Modems Busy	Modems Busy	397	19	Size	4		TR_TOKEN	23
Modem Pool	775	modemsBusyPct	Percent Modems Busy	Pct Modems Busy	377	4	Percent	1	%	100.0*DELTA_TIME*TR_TOKEN/TR_FREQUENCY	98
Modem Pool	775	offhookTime	Pool Off Hook Time	Pool Off Hk Time	382	4	Percent	1	%	100.0*TR_INTERNAL*DELTA_TIME/TR_LOST_FRAME	111
Modem Pool	775	onhookTime	Pool On Hook Time	Pool On Hk Time	381	4	Percent	1	%	100.0*TR_BURST*DELTA_TIME/TR_LOST_FRAME	110
Modem Pool	775	otherErrors	Other Errors	Other Errors	352	0	Rate	0	/sec	DLL_XMT_OFF_FRAMES	6
Modem Pool	775	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Modem Pool	775	retrains	Retrains	Retrains	316	12	Per Call Minute	1	(/Call Min)	TR_SIGNAL_LOSS*60.0*DELTA_TIME/DLL_BYTES	101
Modem Pool	775	testTime	Pool Test Time	Pool Test Time	387	4	Percent	1	%	100.0*TR_LLC_FRAMES*DELTA_TIME/TR_LOST_FRAME	116
Modem Pool	775	unknownTime	Pool Unknown Time	Pool Unk Time	385	4	Percent	1	%	100.0*TR_CONGESTION*DELTA_TIME/TR_LOST_FRAME	114
Response Path	800	attempts	Attempts	Attempts	467	13	Gauge	1		(DLL_BCASTS)	173
Response Path	800	availability	Service Availability	Service Avail	498	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Response Path	800	avgRespTime	Avg. Response Time	Avg Resp Time	440	11	Milliseconds	1	(msec)	((LATENCY/DLL_RCV_OFF_FRAMES)*DELTA_TIME)	172
Response Path	800	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Response Path	800	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_TRANSITS	7
Response Path	800	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	(DLL_XMT_OFF_FRAMES-DLL_TRANSITS)	182
Response Path	800	failedAttempts	Failed Attempts	Failed Attempts	469	4	Percent	1	%	(100*((DLL_BCASTS - DLL_RCV_OFF_FRAMES)/DLL_BCASTS)*DELTA_TIME)	175
Response Path	800	goal	Limit	Limit	474	11	Milliseconds	1	(msec)	($(speed)*DELTA_TIME)	184
Response Path	800	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Response Path	800	maxResponse	Maximum Response	Max Response	443	17	Max Milliseconds	3	(msec)	DLL_BYTES	2
Response Path	800	minResponse	Minimum Response	Min Response	442	16	Min Milliseconds	2	(msec)	DLL_FRAMES	1
Response Path	800	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	('100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Response Path	800	reboots	Reboots	Reboots	121	4	Percent	1	%	('100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Response Path	800	responseVsGoal	ResponseLimit	ResponseLimit	453	4	Percent	1	%	('100*(LATENCY/(($speed)*DLL_RCV_OFF_FRAMES))*DELTA_TIME)	185
Response Path	800	successfulAttempts	Successful Attempts	Successful Att	488	4	Percent	1	%	('100*(DLL_RCV_OFF_FRAMES/DLL_BCASTS)*DELTA_TIME)	174
Response Path w/ Jitter	801	attempts	Attempts	Attempts	467	13	Gauge	1		(DLL_BCASTS)	173
Response Path w/ Jitter	801	availability	Service Availability	Service Avail	498	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Response Path w/ Jitter	801	avgRespTime	Avg. Response Time	Avg Resp Time	440	11	Milliseconds	1	(msec)	(((LATENCY/DLL_RCV_OFF_FRAMES)*DELTA_TIME)	172
Response Path w/ Jitter	801	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	('100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+REBOOTS))*DELTA_TIME	59
Response Path w/ Jitter	801	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_TRANSITS	7
Response Path w/ Jitter	801	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	(DLL_XMT_OFF_FRAMES+DLL_TRANSITS)	182
Response Path w/ Jitter	801	failedAttempts	Failed Attempts	Failed Attempts	469	4	Percent	1	%	('100*((DLL_BCASTS - DLL_RCV_OFF_FRAMES)/DLL_BCASTS)*DELTA_TIME)	175
Response Path w/ Jitter	801	goal	Limit	Limit	474	11	Milliseconds	1	(msec)	($speed)*DELTA_TIME)	184
Response Path w/ Jitter	801	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	('100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Response Path w/ Jitter	801	jitter	Jitter	Jitter	455	11	Milliseconds	1	(msec)	(((DLL_ERRORS+DLL_ENET_FRAMES)*DELTA_TIME/(TR_ADDRESS_COPIED+TR_TOKEN))	186
Response Path w/ Jitter	801	jitterIn	Jitter In	Jitter In	476	11	Milliseconds	1	(msec)	(DLL_ERRORS*DELTA_TIME/TR_TOKEN)	187
Response Path w/ Jitter	801	jitterOut	Jitter Out	Jitter Out	475	11	Milliseconds	1	(msec)	(DLL_ENET_FRAMES*DELTA_TIME/TR_ADDRESS_COPIED)	188
Response Path w/ Jitter	801	maxResponse	Maximum Response	Max Response	443	17	Max Milliseconds	3	(msec)	DLL_BYTES	2
Response Path w/ Jitter	801	minResponse	Minimum Response	Min Response	442	16	Min Milliseconds	2	(msec)	DLL_FRAMES	1
Response Path w/ Jitter	801	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	('100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Response Path w/ Jitter	801	negativeJitter	Negative Jitter	Negative Jitter	478	11	Milliseconds	1	(msec)	(((DLL_COLLISIONS+DLL_ALIGN_ERRORS)*DELTA_TIME/(TR_ADDRESS_COPIED+TR_TOKEN))	190
Response Path w/ Jitter	801	positiveJitter	Positive Jitter	Positive Jitter	477	11	Milliseconds	1	(msec)	(((DLL_ERRORS-DLL_ALIGN_ERRORS)+(DLL_ENET_FRAMES-DLL_COLLISIONS))*DELTA_TIME/(TR_ADDRESS_COPIED+TR_TOKEN))	189
Response Path w/ Jitter	801	reboots	Reboots	Reboots	121	4	Percent	1	%	('100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Response Path w/ Jitter	801	responseVsGoal	ResponseLimit	ResponseLimit	453	4	Percent	1	%	('100*(LATENCY/(($speed)*DLL_RCV_OFF_FRAMES))*DELTA_TIME)	185
Response Path w/ Jitter	801	successfulAttempts	Successful Attempts	Successful Att	488	4	Percent	1	%	('100*((DLL_RCV_OFF_FRAMES/DLL_BCASTS)*DELTA_TIME)	174
Application Response Path	802	attempts	Attempts	Attempts	467	13	Gauge	1		(DLL_BCASTS)	173
Application Response Path	802	availability	Service Availability	Service Avail	498	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Application Response Path	802	avgRespTime	Avg. Response Time	Avg Resp Time	440	11	Milliseconds	1	(msec)	(((LATENCY/DLL_RCV_OFF_FRAMES)*DELTA_TIME)	172
Application Response Path	802	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	('100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Application Response Path	802	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_TRANSITS	7
Application Response Path	802	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	(DLL_XMT_OFF_FRAMES-DLL_TRANSITS)	182
Application Response Path	802	failedAttempts	Failed Attempts	Failed Attempts	469	4	Percent	1	%	('100*((DLL_BCASTS - DLL_RCV_OFF_FRAMES)/DLL_BCASTS)*DELTA_TIME)	175
Application Response Path	802	goal	Limit	Limit	474	11	Milliseconds	1	(msec)	($speed)*DELTA_TIME)	184
Application Response Path	802	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	('100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Application Response Path	802	maxResponse	Maximum Response	Max Response	443	17	Max Milliseconds	3	(msec)	DLL_BYTES	2
Application Response Path	802	minResponse	Minimum Response	Min Response	442	16	Min Milliseconds	2	(msec)	DLL_FRAMES	1
Application Response Path	802	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	('100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58

Appendix A

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Application Response Path	802	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
Application Response Path	802	responseVsGoal	Response/Limit	Response/Limit	453	4	Percent	1	%	(100*(LATENCY/($(speed)*DLL_RCV_OFF_FRAMES))*DELTA_TIME)	185
Application Response Path	802	successfulAttempts	Successful Attempts	Successful Att	468	4	Percent	1	%	(100*(DLL_RCV_OFF_FRAMES/DLL_BCASTS)*DELTA_TIME)	174
FirstSense Response Path	803	attempts	Attempts	Attempts	467	13	Gauge	1		(DLL_BCASTS)	173
FirstSense Response Path	803	availability	Service Availability	Service Avail	498	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
FirstSense Response Path	803	avgClientResponse	Avg. Client Response	Avg Client Resp	592	11	Milliseconds	1	(msec)	(TR_INTERNAL/DLL_RCV_OFF_FRAMES)*DELTA_TIME	210
FirstSense Response Path	803	avgNetworkResponse	Avg. Network Response	Avg Network Resp	594	11	Milliseconds	1	(msec)	((LATENCY-TR_INTERNAL-TR_ABORT)/DLL_RCV_OFF_FRAMES)*DELTA_TIME	212
FirstSense Response Path	803	avgRespTime	Avg. Response Time	Avg Resp Time	440	11	Milliseconds	1	(msec)	((LATENCY/DLL_RCV_OFF_FRAMES)*DELTA_TIME)	172
FirstSense Response Path	803	avgServerResponse	Avg. Server Response	Avg Server Resp	593	11	Milliseconds	1	(msec)	(TR_ABORT/DLL_RCV_OFF_FRAMES)*DELTA_TIME	211
FirstSense Response Path	803	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
FirstSense Response Path	803	bytesIn	Bytes In	Bytes In	18	1	Bytes	0	/sec	DLL_TRANSITS	7
FirstSense Response Path	803	bytesOut	Bytes Out	Bytes Out	20	1	Bytes	0	/sec	(DLL_XMT_OFF_FRAMES-DLL_TRANSITS)	182
FirstSense Response Path	803	failedAttempts	Failed Attempts	Failed Attempts	469	4	Percent	1	%	(100*((DLL_BCASTS - DLL_RCV_OFF_FRAMES)/DLL_BCASTS)*DELTA_TIME)	175
FirstSense Response Path	803	goal	Limit	Limit	474	11	Milliseconds	1	(msec)	($(speed)*DELTA_TIME)	184
FirstSense Response Path	803	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
FirstSense Response Path	803	maxResponse	Maximum Response	Max Response	443	17	Max Milliseconds	3	(msec)	DLL_BYTES	2
FirstSense Response Path	803	minResponse	Minimum Response	Min Response	442	16	Min Milliseconds	2	(msec)	DLL_FRAMES	1
FirstSense Response Path	803	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
FirstSense Response Path	803	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60
FirstSense Response Path	803	responseVsGoal	Response/Limit	Response/Limit	453	4	Percent	1	%	(100*(LATENCY/($(speed)*DLL_RCV_OFF_FRAMES))*DELTA_TIME)	185
FirstSense Response Path	803	successfulAttempts	Successful Attempts	Successful Att	468	4	Percent	1	%	(100*(DLL_RCV_OFF_FRAMES/DLL_BCASTS)*DELTA_TIME)	174
FirstSense Response Path	803	tcpConnectFailures	TCP Connect Failures	TCP Failures	543	4	Percent	1	%	(100*((DLL_COLLISIONS - DLL_ERRORS)/DLL_COLLISIONS)*DELTA_TIME)	203
FirstSense Response Path	803	tcpConnectSuccesses	TCP Connect Successes	TCP Successes	542	4	Percent	1	%	(100*(DLL_ERRORS/DLL_COLLISIONS)*DELTA_TIME)	202
FirstSense Response Path	803	tcpConnectTime	TCP Connect Time (msec)	TCP Connect Time	541	11	Milliseconds	1	(msec)	((DLL_ENET_FRAMES/DLL_RCV_OFF_FRAMES)*DELTA_TIME)	200
FirstSense Response Path	803	thresholdViolations	Threshold Violations	Thld Violations	719	13	Gauge	1		TR_BURST	17
FirstSense Response Path	803	transactions	Transactions	Transactions	441	18	Transactions	1	/min	(DLL_RCV_OFF_FRAMES*60)	201
Empire Service Response Path	805	attempts	Attempts	Attempts	467	13	Gauge	1		(DLL_BCASTS)	173
Empire Service Response Path	805	availability	Service Availability	Service Avail	498	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
Empire Service Response Path	805	avgRespTime	Avg. Response Time	Avg Resp Time	440	11	Milliseconds	1	(msec)	((LATENCY/DLL_RCV_OFF_FRAMES)*DELTA_TIME)	172
Empire Service Response Path	805	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
Empire Service Response Path	805	dnsLookupTimeAvg	Avg. DNS Lookup Time (msec)	Avg DNS Time	608	11	Milliseconds	1	(msec)	((TR_SIGNAL_LOSS/DLL_RCV_OFF_FRAMES)*DELTA_TIME)	223
Empire Service Response Path	805	dnsLookupTimeMax	Max. DNS Lookup Time (msec)	Max DNS Time	610	17	Max Milliseconds	3	(msec)	TR_CONTENTION_STREAMING	15
Empire Service Response Path	805	dnsLookupTimeMin	Min. DNS Lookup Time (msec)	Min DNS Time	609	16	Min Milliseconds	2	(msec)	TR_BIT_STREAMING	14
Empire Service Response Path	805	failedAttempts	Failed Attempts	Failed Attempts	469	4	Percent	1	%	(100*((DLL_BCASTS - DLL_RCV_OFF_FRAMES)/DLL_BCASTS)*DELTA_TIME)	175
Empire Service Response Path	805	goal	Limit	Limit	474	11	Milliseconds	1	(msec)	($(speed)*DELTA_TIME)	184
Empire Service Response Path	805	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
Empire Service Response Path	805	maxResponse	Maximum Response	Max Response	443	17	Max Milliseconds	3	(msec)	DLL_BYTES	2
Empire Service Response Path	805	minResponse	Minimum Response	Min Response	442	16	Min Milliseconds	2	(msec)	DLL_FRAMES	1
Empire Service Response Path	805	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
Empire Service Response Path	805	reboots	Reboots	Reboots	121	4	Percent	1	%	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	60

label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
Empire Service Response Path	805	responseVsGoal	Response/Limit	Response/Limit	453	4	Percent	1	%	(100*(LATENCY/($cpood*DLL_RCV_OFF_FRAMES))*DELTA_TIME)	185
Empire Service Response Path	805	successfulAttempts	Successful Attempts	Successful Att	468	4	Percent	1	%	(100*(DLL_RCV_OFF_FRAMES/DLL_BCASTS)*DELTA_TIME)	174
Empire Service Response Path	805	tcpConnectTimeAvg	Avg. TCP Connect Time (msec)	Avg TCP Con Time	605	11	Milliseconds	1	(msec)	((DLL_ENET_FRAMES/DLL_RCV_OFF_FRAMES)*DELTA_TIME)	222
Empire Service Response Path	805	tcpConnectTimeMax	Max. TCP Connect Time (msec)	Max TCP Con Time	607	17	Max Milliseconds	3	(msec)	TR_SET_RECOVERY_MODE	12
Empire Service Response Path	805	tcpConnectTimeMin	Min. TCP Connect Time (msec)	Min TCP Con Time	606	16	Min Milliseconds	2	(msec)	DLL_ALGN_ERRORS	11
Empire Service Response Path	805	transactions	Transactions	Transactions	441	18	Transactions	1	/min	(DLL_RCV_OFF_FRAMES*60)	201
Empire Service Response Path	805	transactionTimeAvg	Avg. Transaction Time (msec)	Avg Trans Time	611	11	Milliseconds	1	(msec)	((TR_ADDRESS_COPIED/DLL_RCV_OFF_FRAMES)*DELTA_TIME)	224
Empire Service Response Path	805	transactionTimeMax	Max. Transaction Time (msec)	Max Trans Time	613	17	Max Milliseconds	3	(msec)	TR_LOST_FRAME	22
Empire Service Response Path	805	transactionTimeMin	Min. Transaction Time (msec)	Min Trans Time	612	16	Min Milliseconds	2	(msec)	TR_CONGESTION	21
System Partition	3000	availability	Availability	Availability	181	10	Total Time	1	(%)	(AVAILABLE_TIME*100.0)	77
System Partition	3000	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*BAD_POLLS/((GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
System Partition	3000	goodPolls	Good Polls	Good Polls	116	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
System Partition	3000	inodeUtilization	Inode Util	Inode Util	581	4	Percent	1	%	D_POLLS+REBOOTS))*DELTA_TIME	1
System Partition	3000	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	DLL_FRAMES	81
System Partition	3000	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	LATENCY	58
System Partition	3000	partitionAllocationFailures	Partition Allocation Failures	Part Alloc Fails	157	5	Per Second	1		(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	27
System Partition	3000	partitionReads	Partition Reads	Part Reads	154	0	Rate	0	/sec	AD_POLLS+REBOOTS))*DELTA_TIME	26
System Partition	3000	partitionReadsWrites	Partition Reads&Writes	Part Reads&Wrts	156	0	Rate	0	/sec	PACKETS_IN	30
System Partition	3000	partitionStorageCapacity	Partition Storage Capacity	Part Stor Cap	152	7	Bytes	4	(bytes)	BYTES_IN	24
System Partition	3000	partitionStorageFree	Partition Storage Free	Part Stor Free	601	7	Bytes	4	(bytes)	BYTES_OUT	218
System Partition	3000	partitionStorageUsed	Partition Storage Used	Part Stor Used	151	7	Bytes	4	(bytes)	TR_FREQUENCY	25
System Partition	3000	partitionUtilization	Partition Utilization	Part Util	153	4	Percent	1	%	(TR_FREQUENCY*TR_FRAME_COPIED)	26
System Partition	3000	partitionWrites	Partition Writes	Part Writes	155	0	Rate	0	/sec	TR_FRAME_COPIED	76
System Partition	3000	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	PACKETS_OUT	60
System Partition	3000	reboots	Reboots	Reboots	121	4	Percent	1	%	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	77
BMC NT System Partition	3001	availability	Availability	Availability	181	10	Total Time	1	(%)	(100.0*REBOOTS/((GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
BMC NT System Partition	3001	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(AVAILABLE_TIME*100.0)	57
BMC NT System Partition	3001	goodPolls	Good Polls	Good Polls	116	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	81
BMC NT System Partition	3001	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	D_POLLS+REBOOTS))*DELTA_TIME	81
BMC NT System Partition	3001	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	LATENCY	58
BMC NT System Partition	3001	partitionStorageCapacity	Partition Storage Capacity	Part Stor Cap	152	7	Bytes	4	(bytes)	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	88
BMC NT System Partition	3001	partitionStorageUsed	Partition Storage Used	Part Stor Used	151	7	Bytes	4	(bytes)	AD_POLLS+REBOOTS))*DELTA_TIME	24
BMC NT System Partition	3001	partitionUtilization	Partition Utilization	Part Util	153	4	Percent	1	%	TR_FREQUENCY	25
BMC NT System Partition	3001	reachability	Reachability	Reachability	182	10	Total Time	1	(%)	TR_FRAME_COPIED	82
BMC NT System Partition	3001	reboots	Reboots	Reboots	121	4	Percent	1	%	100.0*DELTA_TIME*TR_FRAME_COPIED/TR_FREQUENCY	76
BMC UNIX System Partition	3002	availability	Availability	Availability	181	10	Total Time	1	(%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	60
BMC UNIX System Partition	3002	badPolls	Bad Polls	Bad Polls	120	4	Percent	1	%	(100.0*REBOOTS/((GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	77
BMC UNIX System Partition	3002	goodPolls	Good Polls	Good Polls	118	4	Percent	1	%	(AVAILABLE_TIME*100.0)	59
BMC UNIX System Partition	3002	latency	Latency	Latency	208	11	Milliseconds	1	(msec)	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	87
BMC UNIX System Partition	3002	missedPolls	Missed Polls	Missed Polls	119	4	Percent	1	%	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	81
										D_POLLS+REBOOTS))*DELTA_TIME	59
										LATENCY	81
										(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58

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label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
BMC UNIX System Partition	3002	partitionStorageCapacity	Partition Storage Capacity	Part Stor Cap	152	7	Bytes		4 (bytes)	TR_FREQUENCY	24
BMC UNIX System Partition	3002	partitionStorageUsed	Partition Storage Used	Part Stor Used	151	7	Bytes		4 (bytes)	TR_FRAME_COPIED	25
BMC UNIX System Partition	3002	partitionUtilization	Partition Utilization	Part Util	153	4	Percent		1 %	100.0*DELTA_TIME*TR_FRAME_COPIED/TR_FREQUENCY	62
BMC UNIX System Partition	3002	reachability	Reachability	Reachability	182	10	Total Time		1 (%)	(REACHABLE_TIME*100.0*DELTA_TIME/(TOTAL_TIME*1.0))	76
BMC UNIX System Partition	3002	reboots	Reboots	Reboots	121	4	Percent		1 %	(100.0*REBOOTS/(GOOD_POLLS+MISSED_POLLS+BAD_P OLLS+REBOOTS))*DELTA_TIME	60
UNIX Process Set	3100	availability	Availability	Availability	181	10	Total Time		1 (%)	(AVAILABLE_TIME*100.0)	77
UNIX Process Set	3100	badPolls	Bad Polls	Bad Polls	120	4	Percent		1 %	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_ POLLS+REBOOTS))*DELTA_TIME	59
UNIX Process Set	3100	cpuUtilization	CPU Utilization	CPU Utilization	596	4	Percent		1 %	DIL_BYTES	2
UNIX Process Set	3100	diskBlockReads	Disk Block Reads	Disk Blk Reads	586	0	Rate		0 /sec	DIL_TRANSITS	7
UNIX Process Set	3100	diskBlockWrites	Disk Block Writes	Disk Blk Writes	587	0	Rate		0 /sec	DIL_ENET_FRAMES	8
UNIX Process Set	3100	goodPolls	Good Polls	Good Polls	118	4	Percent		1 %	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BA D_POLLS+REBOOTS))*DELTA_TIME	57
UNIX Process Set	3100	hardPageFaults	Hard Page Faults	Hard Page Faults	595	0	Rate		0 /sec	TR_SIGNAL_LOSS	13
UNIX Process Set	3100	hardPageFaultsPct	Hard Page Faults %	Hard Pg Faults %	573	4	Percent		1 %	100.0*DELTA_TIME*(TR_SIGNAL_LOSS/(TR_SIGNAL_LOSS +TR_BIT_STREAMING))	213
UNIX Process Set	3100	missedPolls	Missed Polls	Missed Polls	119	4	Percent		1 %	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+B AD_POLLS+REBOOTS))*DELTA_TIME	58
UNIX Process Set	3100	networkMessages	Network Msgs	Network Msgs	707	0	Rate		0 /sec	DIL_COLLISIONS+DIL_ERRORS	312
UNIX Process Set	3100	networkMessagesIn	Net Msgs In	Net Msgs In	588	0	Rate		0 /sec	DIL_COLLISIONS	9
UNIX Process Set	3100	networkMessagesOut	Net Msgs Out	Net Msgs Out	589	0	Rate		0 /sec	DIL_ERRORS	10
UNIX Process Set	3100	physicalMemoryUsed	Physical Memory	Physical Memory	145	7	Bytes		4 (bytes)	DIL_MCASTS	3
UNIX Process Set	3100	softPageFaults	Soft Page Faults	Soft Page Faults	584	0	Rate		0 /sec	TR_BIT_STREAMING	14
UNIX Process Set	3100	swaps	Swaps	Swaps	566	0	Rate		0 /sec	TR_CONTENTION_STREAMING	15
UNIX Process Set	3100	systemCalls	System Calls	System Calls	562	0	Rate		0 /sec	DIL_ALGN_ERRORS	11
UNIX Process Set	3100	threads	Threads	Threads	563	19	Size		4	TR_SET_RECOVERY_MODE	12
UNIX Process Set	3100	totalPageFaults	Total Page Faults	Total Pg Faults	575	0	Rate		0 /sec	(TR_SIGNAL_LOSS+TR_BIT_STREAMING)	216
UNIX Process Set	3100	virtualMemoryUsed	Virtual Memory Used	Vir Mem Used	150	7	Bytes		4 (bytes)	DIL_BCASTS	4
NT Process Set	3101	availability	Availability	Availability	181	10	Total Time		1 (%)	(AVAILABLE_TIME*100.0)	77
NT Process Set	3101	badPolls	Bad Polls	Bad Polls	120	4	Percent		1 %	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_ POLLS+REBOOTS))*DELTA_TIME	59
NT Process Set	3101	cpuUtilization	CPU Utilization	CPU Utilization	596	4	Percent		1 %	DIL_BYTES	2
NT Process Set	3101	goodPolls	Good Polls	Good Polls	118	4	Percent		1 %	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BA D_POLLS+REBOOTS))*DELTA_TIME	57
NT Process Set	3101	missedPolls	Missed Polls	Missed Polls	119	4	Percent		1 %	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+B AD_POLLS+REBOOTS))*DELTA_TIME	58
NT Process Set	3101	physicalMemoryUsed	Physical Memory Used	Physical Memory	145	7	Bytes		4 (bytes)	DIL_MCASTS	3
NT Process Set	3101	threads	Threads	Threads	563	19	Size		4	TR_SET_RECOVERY_MODE	12
NT Process Set	3101	totalPageFaults	Total Page Faults	Total Pg Faults	575	0	Rate		0 /sec	(TR_SIGNAL_LOSS+TR_BIT_STREAMING)	215
UNIX Process Set Excluded	3200	availability	Availability	Availability	181	10	Total Time		1 (%)	(AVAILABLE_TIME*100.0)	77
UNIX Process Set Excluded	3200	badPolls	Bad Polls	Bad Polls	120	4	Percent		1 %	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_ POLLS+REBOOTS))*DELTA_TIME	59
UNIX Process Set Excluded	3200	cpuUtilization	CPU Utilization	CPU Utilization	596	4	Percent		1 %	DIL_BYTES	2
UNIX Process Set Excluded	3200	diskBlockReads	Disk Block Reads	Disk Blk Reads	586	0	Rate		0 /sec	DIL_TRANSITS	7
UNIX Process Set Excluded	3200	diskBlockWrites	Disk Block Writes	Disk Blk Writes	587	0	Rate		0 /sec	DIL_ENET_FRAMES	8
UNIX Process Set Excluded	3200	goodPolls	Good Polls	Good Polls	118	4	Percent		1 %	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BA D_POLLS+REBOOTS))*DELTA_TIME	57
UNIX Process Set Excluded	3200	hardPageFaults	Hard Page Faults	Hard Page Faults	565	0	Rate		0 /sec	TR_SIGNAL_LOSS	13
UNIX Process Set Excluded	3200	hardPageFaultsPct	Hard Page Faults %	Hard Pg Faults %	573	4	Percent		1 %	100.0*DELTA_TIME*(TR_SIGNAL_LOSS/(TR_SIGNAL_LOSS +TR_BIT_STREAMING))	213
UNIX Process Set Excluded	3200	missedPolls	Missed Polls	Missed Polls	119	4	Percent		1 %	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+B AD_POLLS+REBOOTS))*DELTA_TIME	58
UNIX Process Set Excluded	3200	networkMessagesIn	Network Messages In	Net Msgs In	588	0	Rate		0 /sec	DIL_COLLISIONS	9
UNIX Process Set Excluded	3200	networkMessagesOut	Network Messages Out	Net Msgs Out	589	0	Rate		0 /sec	DIL_ERRORS	10
UNIX Process Set Excluded	3200	physicalMemoryUsed	Physical Memory Used	Physical Memory	145	7	Bytes		4 (bytes)	DIL_MCASTS	3
UNIX Process Set Excluded	3200	softPageFaults	Soft Page Faults	Soft Page Faults	564	0	Rate		0 /sec	TR_BIT_STREAMING	14

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label	element_type	symbol	label	short_label	var_id	units_id	label	units_type	text	col_expression	col_id
UNIX Process Set Excluded	3200	swaps	Swaps	Swaps	566	0	Rate		0 /sec	TR_CONTENTION_STREAMING	16
UNIX Process Set Excluded	3200	systemCalls	System Calls	System Calls	562	0	Rate		0 /sec	DLL_ALGN_ERRORS	11
UNIX Process Set Excluded	3200	threads	Threads	Threads	563	19	Size	4		TR_SET_RECOVERY_MODE	12
UNIX Process Set Excluded	3200	totalPageFaults	Total Page Faults	Total Pg Faults	676	0	Rate		0 /sec	(TR_SIGNAL_LOSS+TR_BIT_STREAMING)	215
UNIX Process Set Excluded	3200	virtualMemoryUsed	Virtual Memory Used	Vir Mem Used	150	7	Bytes		4 (bytes)	DLL_BCASTS	4
NT Process Set Excluded	3201	availability	Availability	Availability	181	10	Total Time		1 (%)	(AVAILABLE_TIME*100.0)	77
NT Process Set Excluded	3201	badPolls	Bad Polls	Bad Polls	120	4	Percent		1 %	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
NT Process Set Excluded	3201	cpuUtilization	CPU Utilization	CPU Utilization	596	4	Percent		1 %	DLL_BYTES	2
NT Process Set Excluded	3201	goodPolls	Good Polls	Good Polls	118	4	Percent		1 %	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
NT Process Set Excluded	3201	missedPolls	Missed Polls	Missed Polls	119	4	Percent		1 %	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
NT Process Set Excluded	3201	physicalMemoryUsed	Physical Memory Used	Physical Memory	145	7	Bytes		4 (bytes)	DLL_MCASTS	3
NT Process Set Excluded	3201	threads	Threads	Threads	563	19	Size	4		TR_SET_RECOVERY_MODE	12
NT Process Set Excluded	3201	totalPageFaults	Total Page Faults	Total Pg Faults	575	0	Rate		0 /sec	(TR_SIGNAL_LOSS+TR_BIT_STREAMING)	215
UNIX Process	3300	availability	Availability	Availability	181	10	Total Time		1 (%)	(AVAILABLE_TIME*100.0)	77
UNIX Process	3300	badPolls	Bad Polls	Bad Polls	120	4	Percent		1 %	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
UNIX Process	3300	cpuUtilization	CPU Utilization	CPU Utilization	596	4	Percent		1 %	DLL_BYTES	2
UNIX Process	3300	diskBlockReads	Disk Block Reads	Disk Blk Reads	586	0	Rate		0 /sec	DLL_TRANSITS	7
UNIX Process	3300	diskBlockWrites	Disk Block Writes	Disk Blk Writes	587	0	Rate		0 /sec	DLL_ENET_FRAMES	8
UNIX Process	3300	goodPolls	Good Polls	Good Polls	118	4	Percent		1 %	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
UNIX Process	3300	hardPageFaults	Hard Page Faults	Hard Page Faults	565	0	Rate		0 /sec	TR_SIGNAL_LOSS	13
UNIX Process	3300	hardPageFaultsPct	Hard Page Faults %	Hard Pg Faults %	573	4	Percent		1 %	100.0*DELTA_TIME*(TR_SIGNAL_LOSS/(TR_SIGNAL_LOSS+TR_BIT_STREAMING))	213
UNIX Process	3300	latency	Latency	Latency	208	11	Milliseconds		1 (msec)	LATENCY	81
UNIX Process	3300	missedPolls	Missed Polls	Missed Polls	119	4	Percent		1 %	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
UNIX Process	3300	networkMessagesIn	Network Messages In	Net Msgs In	588	0	Rate		0 /sec	DLL_COLLISIONS	9
UNIX Process	3300	networkMessagesOut	Network Messages Out	Net Msgs Out	589	0	Rate		0 /sec	DLL_ERRORS	10
UNIX Process	3300	physicalMemoryUsed	Physical Memory Used	Physical Memory	145	7	Bytes		4 (bytes)	DLL_MCASTS	3
UNIX Process	3300	softPageFaults	Soft Page Faults	Soft Page Faults	564	0	Rate		0 /sec	TR_BIT_STREAMING	14
UNIX Process	3300	swaps	Swaps	Swaps	566	0	Rate		0 /sec	TR_CONTENTION_STREAMING	15
UNIX Process	3300	systemCalls	System Calls	System Calls	562	0	Rate		0 /sec	DLL_ALGN_ERRORS	11
UNIX Process	3300	threads	Threads	Threads	563	19	Size	4		TR_SET_RECOVERY_MODE	12
UNIX Process	3300	totalPageFaults	Total Page Faults	Total Pg Faults	575	0	Rate		0 /sec	(TR_SIGNAL_LOSS+TR_BIT_STREAMING)	215
UNIX Process	3300	virtualMemoryUsed	Virtual Memory Used	Vir Mem Used	150	7	Bytes		4 (bytes)	DLL_BCASTS	4
NT Process	3301	availability	Availability	Availability	181	10	Total Time		1 (%)	(AVAILABLE_TIME*100.0)	77
NT Process	3301	badPolls	Bad Polls	Bad Polls	120	4	Percent		1 %	(100.0*BAD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	59
NT Process	3301	cpuUtilization	CPU Utilization	CPU Utilization	596	4	Percent		1 %	DLL_BYTES	2
NT Process	3301	goodPolls	Good Polls	Good Polls	118	4	Percent		1 %	(100.0*GOOD_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	57
NT Process	3301	latency	Latency	Latency	208	11	Milliseconds		1 (msec)	LATENCY	81
NT Process	3301	missedPolls	Missed Polls	Missed Polls	119	4	Percent		1 %	(100.0*MISSED_POLLS/(GOOD_POLLS+MISSED_POLLS+BAD_POLLS+REBOOTS))*DELTA_TIME	58
NT Process	3301	physicalMemoryUsed	Physical Memory Used	Physical Memory	145	7	Bytes		4 (bytes)	DLL_MCASTS	3
NT Process	3301	threads	Threads	Threads	563	19	Size	4		TR_SET_RECOVERY_MODE	12
NT Process	3301	totalPageFaults	Total Page Faults	Total Pg Faults	575	0	Rate		0 /sec	(TR_SIGNAL_LOSS+TR_BIT_STREAMING)	215

Appendix A

Profile ID	Profile Name	Event Type	Description	Event ID	Severity	Threshold	Window	Duration	Rule	Variable	Direction	Threshold 1	Threshold 2
1042	ATM - Unusual Workload	ATM Port	Unusually high cells in	105	Warning	15	60	UV	cellsIn	above	99.9	1 TOT	bandwidthIn	above	25
1042	ATM - Unusual Workload	ATM Port	Unusually high cells out	106	Warning	15	60	UV	cellsOut	above	99.9	1 TOT	bandwidthOut	above	25
1042	ATM - Unusual Workload	ATM Path	Unusually high cells in	105	Warning	15	60	UV	cellsIn	above	99.9	1 TOT	bandwidthIn	above	25
1042	ATM - Unusual Workload	ATM Path	Unusually high cells out	106	Warning	15	60	UV	cellsOut	above	99.9	1 TOT	bandwidthOut	above	25
1043	ATM - Unusual Workload	ATM Channel	Unusually high AAL5 PDUs In	107	Warning	15	60	UV	aal5PduIn	above	99.9	1 TOT	bandwidthIn	above	25
1043	ATM - Unusual Workload	ATM Channel	Unusually high AAL5 PDUs out	107	Warning	15	60	UV	aal5PduOut	above	99.9	1 TOT	bandwidthOut	above	25
1043	ATM - Unusual Workload	ATM Channel	Unusually high cells In	107	Warning	15	60	UV	cellsIn	above	99.9	1 TOT	bandwidthIn	above	25
1043	ATM - Unusual Workload	ATM Channel	Unusually high cells out	107	Warning	15	60	UV	cellsOut	above	99.9	1 TOT	bandwidthOut	above	25
1023	ATM for the Enterprise - Failure	ATM Port	ATM Port Down	105	Critical		30	AVAIL	availability						
1023	ATM for the Enterprise - Failure	ATM Port	ATM Port Speed is set too low	105	Minor	10	60	TOT	bandwidthIn	above	100				
1023	ATM for the Enterprise - Failure	ATM Port	ATM Port Speed is set too low	106	Minor	10	60	TOT	bandwidthIn	above	100				
1023	ATM for the Enterprise - Failure	ATM Port	ATM Port Speed Out set too low	105	Minor	10	60	TOT	bandwidthOut	above	100				
1023	ATM for the Enterprise - Failure	ATM Port	ATM Port Speed Out set too low	106	Minor	10	60	TOT	bandwidthOut	above	100				
1023	ATM for the Enterprise - Failure	ATM Port	Too many seconds with errors	105	Minor	15	60	TOT	erroredSeconds	above	5				
1023	ATM for the Enterprise - Failure	ATM Port	Too many seconds with severe errors	105	Major	5	60	TOT	severelyErroredSeconds	above	5				
1023	ATM for the Enterprise - Failure	ATM Port	Too many unavailable seconds	105	Critical	5	60	TOT	unavailableSeconds	above	0				
1023	ATM for the Enterprise - Failure	ATM Path	ATM Path Down	106	Critical		30	AVAIL	availability	above	0				
1023	ATM for the Enterprise - Failure	ATM Channel	ATM Circuit Down	101	Critical		30	AVAIL	availability						
1001	ATM for the Enterprise TI - Delay	ATM Port	Over Utilized In	105	Minor	15	60	TOT	bandwidthIn	above	75				
1001	ATM for the Enterprise TI - Delay	ATM Port	Over Utilized Out	106	Minor	15	60	TOT	bandwidthOut	above	75				
1001	ATM for the Enterprise TI - Delay	ATM Port	Too many CLP 1 frames in	105	Minor	15	60	TOT	clp1CellsInPct	above	75				
1001	ATM for the Enterprise TI - Delay	ATM Port	Too many discarded cells in	105	Minor	15	60	TOT	discardsInPct	above	10				
1001	ATM for the Enterprise TI - Delay	ATM Port	Too many discarded cells out	106	Minor	15	60	TOT	discardsOutPct	above	0.5				
1001	ATM for the Enterprise TI - Delay	ATM Port	Too many AAL5 frames discarded	105	Minor	15	60	TOT	aal5PduDiscardsPct	above	0.5				
1001	ATM for the Enterprise TI - Delay	ATM Channel	Too many AAL5 frames discarded	107	Minor	15	60	TOT	aal5PduDiscardsPct	above	1				
1001	ATM for the Enterprise TI - Delay	ATM Channel	Too many CLP 1 frames in	107	Minor	15	60	TOT	clp1CellsInPct	above	10				
1001	ATM for the Enterprise TI - Delay	ATM Channel	Too many discarded cells in	107	Minor	15	60	TOT	discardsInPct	above	0.5				
1001	ATM for the Enterprise TI - Delay	ATM Channel	Traffic In over SCR	107	Minor	15	60	TOT	bandwidthIn	above	100				
1001	ATM for the Enterprise TI - Delay	ATM Channel	Traffic Out over SCR	107	Minor	15	60	TOT	bandwidthOut	above	100				
1002	ATM for the Enterprise TI - Delay	ATM Channel	Traffic In over SCR	107	Minor	15	60	TOT	bandwidthIn	above	100				
1002	ATM for the Enterprise TI - Delay	ATM Channel	Traffic Out over SCR	107	Minor	15	60	TOT	bandwidthOut	above	100				
1024	ATM for the Service Provider - Failure	ATM Port	ATM Port Down	105	Critical		30	AVAIL	availability						
1024	ATM for the Service Provider - Failure	ATM Port	Too many seconds with errors	105	Major	15	60	TOT	erroredSeconds	above	5				
1024	ATM for the Service Provider - Failure	ATM Port	Too many seconds with severe errors	105	Major	5	60	TOT	severelyErroredSeconds	above	0				
1024	ATM for the Service Provider - Failure	ATM Port	Too many unavailable seconds	105	Critical	5	60	TOT	unavailableSeconds	above	0				
1024	ATM for the Service Provider - Failure	ATM Path	ATM Path Down	106	Critical		30	AVAIL	availability						
1024	ATM for the Service Provider - Failure	ATM Channel	ATM Circuit Down	101	Critical		30	AVAIL	availability						
1003	ATM for the Service Provider TI - Delay	ATM Port	Over Utilized In	105	Minor	15	60	TOT	bandwidthIn	above	75				
1003	ATM for the Service Provider TI - Delay	ATM Port	Over Utilized Out	106	Minor	15	60	TOT	bandwidthOut	above	75				
1003	ATM for the Service Provider TI - Delay	ATM Port	Policy Violations In	105	Minor	15	60	TOT	policyViolationsInPct	above	10				
1003	ATM for the Service Provider TI - Delay	ATM Port	Policy Violations Out	106	Minor	15	60	TOT	policyViolationsOutPct	above	3				
1003	ATM for the Service Provider TI - Delay	ATM Port	Too many CLP0 frames discarded	105	Minor	15	60	TOT	clp0CellsInPct	above	0.1				
1003	ATM for the Service Provider TI - Delay	ATM Port	Too many CLP1 frames in	105	Minor	15	60	TOT	clp1CellsInPct	above	10				
1003	ATM for the Service Provider TI - Delay	ATM Port	Too many discarded cells out	106	Minor	15	60	TOT	discardsOutPct	above	0.1				
1024	ATM for the Service Provider - Failure	ATM Channel	ATM Circuit Down	101	Critical		30	AVAIL	availability						
1003	ATM for the Service Provider TI - Delay	ATM Port	Over Utilized In	105	Minor	15	60	TOT	bandwidthIn	above	75				
1003	ATM for the Service Provider TI - Delay	ATM Port	Over Utilized Out	106	Minor	15	60	TOT	bandwidthOut	above	75				
1003	ATM for the Service Provider TI - Delay	ATM Port	Policy Violations In	105	Minor	15	60	TOT	policyViolationsInPct	above	10				
1003	ATM for the Service Provider TI - Delay	ATM Port	Policy Violations Out	106	Minor	15	60	TOT	policyViolationsOutPct	above	3				
1003	ATM for the Service Provider TI - Delay	ATM Port	Too many CLP0 frames discarded	105	Minor	15	60	TOT	clp0CellsInPct	above	0.1				
1003	ATM for the Service Provider TI - Delay	ATM Port	Too many CLP1 frames in	105	Minor	15	60	TOT	clp1CellsInPct	above	10				
1003	ATM for the Service Provider TI - Delay	ATM Port	Too many discarded cells out	106	Minor	15	60	TOT	discardsOutPct	above	0.1				
1003	ATM for the Service Provider TI - Delay	ATM Path	Over Utilized In	105	Minor	15	60	TOT	bandwidthIn	above	75				
1003	ATM for the Service Provider TI - Delay	ATM Path	Over Utilized Out	106	Minor	15	60	TOT	bandwidthOut	above	75				
1003	ATM for the Service Provider TI - Delay	ATM Path	Too many CLP0 frames discarded	105	Minor	15	60	TOT	clp0CellsInPct	above	0.1				
1003	ATM for the Service Provider TI - Delay	ATM Path	Too many CLP1 frames in	105	Minor	15	60	TOT	clp1CellsInPct	above	10				
1003	ATM for the Service Provider TI - Delay	ATM Path	Too many discarded cells out	106	Minor	15	60	TOT	discardsOutPct	above	0.1				
1003	ATM for the Service Provider TI - Delay	ATM Channel	Too many CLP0 frames discarded	107	Minor	15	60	TOT	clp0CellsInPct	above	0.1				
1003	ATM for the Service Provider TI - Delay	ATM Channel	Too many CLP1 frames in	107	Minor	15	60	TOT	clp1CellsInPct	above	10				
1003	ATM for the Service Provider TI - Delay	ATM Channel	Too many discarded cells in	107	Minor	15	60	TOT	discardsInPct	above	0.5				
1003	ATM for the Service Provider TI - Delay	ATM Channel	Traffic In over SCR	107	Minor	15	60	TOT	bandwidthIn	above	100				
1003	ATM for the Service Provider TI - Delay	ATM Channel	Traffic Out over SCR	107	Minor	15	60	TOT	bandwidthOut	above	100				
1004	ATM for the Service Provider TI - Delay	ATM Port	Over Utilized In	105	Minor	15	60	TOT	bandwidthIn	above	90				
1004	ATM for the Service Provider TI - Delay	ATM Port	Over Utilized Out	106	Minor	15	60	TOT	bandwidthOut	above	90				
1004	ATM for the Service Provider TI - Delay	ATM Port	Policy Violations In	105	Minor	15	60	TOT	policyViolationsInPct	above	10				
1004	ATM for the Service Provider TI - Delay	ATM Port	Policy Violations Out	106	Minor	15	60	TOT	policyViolationsOutPct	above	3				
1004	ATM for the Service Provider TI - Delay	ATM Port	Too many CLP0 frames discarded	105	Minor	15	60	TOT	clp0CellsInPct	above	0.1				
1004	ATM for the Service Provider TI - Delay	ATM Port	Too many CLP1 frames in	105	Minor	15	60	TOT	clp1CellsInPct	above	10				
1004	ATM for the Service Provider TI - Delay	ATM Port	Too many discarded cells out	106	Minor	15	60	TOT	discardsOutPct	above	0.1				
1004	ATM for the Service Provider TI - Delay	ATM Path	Over Utilized In	105	Minor	15	60	TOT	bandwidthIn	above	90				
1004	ATM for the Service Provider TI - Delay	ATM Path	Over Utilized Out	106	Minor	15	60	TOT	bandwidthOut	above	90				
1004	ATM for the Service Provider TI - Delay	ATM Path	Too many CLP0 frames discarded	105	Minor	15	60	TOT	clp0CellsInPct	above	0.1				
1004	ATM for the Service Provider TI - Delay	ATM Path	Too many CLP1 frames in	105	Minor	15	60	TOT	clp1CellsInPct	above	10				
1004	ATM for the Service Provider TI - Delay	ATM Path	Too many discarded cells out	106	Minor	15	60	TOT	discardsOutPct	above	0.1				
1004	ATM for the Service Provider TI - Delay	ATM Channel	Too many CLP0 frames discarded	107	Minor	15	60	TOT	clp0CellsInPct	above	0.1				
1004	ATM for the Service Provider TI - Delay	ATM Channel	Too many CLP1 frames in	107	Minor	15	60	TOT	clp1CellsInPct	above	10				
1004	ATM for the Service Provider TI - Delay	ATM Channel	Too many discarded cells in	107	Minor	15	60	TOT	discardsInPct	above	0.5				
1004	ATM for the Service Provider TI - Delay	ATM Channel	Too many discarded cells out	107	Minor	15	60	TOT	discardsOutPct	above	0.5				

Appendix B

Appendix B

Profile ID	Profile Name	EType	Element Type	Description	Severity	Window	duration	Rule	Variable	Direction	Threshold	AND	Rule	Variable	Direction	Threshold
1052	Ethernet Shared Segment - Unusual Workload	2	MIB2 LAN Port	Unusually high frames out	Warning	15	60	UV	framesOut	above	99.9	1	TOT	bandwidthOut	above	10
1052	Ethernet Shared Segment - Unusual Workload	2	MIB2 LAN Port	Unusually high non-unicast frames in	Warning	15	60	UV	nonUnicastIn	above	99.9	1	TOT	bandwidthIn	above	10
1052	Ethernet Shared Segment - Unusual Workload	2	MIB2 LAN Port	Unusually high non-unicast frames out	Warning	15	60	UV	nonUnicastOut	above	99.9	1	TOT	bandwidthOut	above	10
1046	Frame Relay - Unusual Workload	101	Frame Relay	Unusually high frames in	Warning	15	60	UV	framesIn	above	99.9					
1046	Frame Relay - Unusual Workload	101	Frame Relay	Unusually high frames out	Warning	15	60	UV	framesOut	above	99.9					
1008	Frame Relay for the Enterprise - Delay	101	Frame Relay	Congestion in network on inbound data received	Minor	15	60	TOT	fecnInPct	above	2					
1008	Frame Relay for the Enterprise - Delay	101	Frame Relay	Congestion in network on inbound data received over C	Major	15	60	TOT	fecnInPct	above	2	1	TOT	bandwidthIn	above	150
1008	Frame Relay for the Enterprise - Delay	101	Frame Relay	Congestion in network on inbound data received under	Major	15	60	TOT	fecnInPct	above	2	1	TOT	bandwidthIn	below	50
1008	Frame Relay for the Enterprise - Delay	101	Frame Relay	Congestion in network on outbound data sent	Minor	15	60	TOT	becnInPct	above	2					
1008	Frame Relay for the Enterprise - Delay	101	Frame Relay	Congestion in network on outbound data sent over CIR	Major	15	60	TOT	becnInPct	above	2	1	TOT	bandwidthOut	above	150
1008	Frame Relay for the Enterprise - Delay	101	Frame Relay	Congestion in network on outbound data sent under CI	Major	15	60	TOT	becnInPct	above	2	1	TOT	bandwidthOut	below	50
1008	Frame Relay for the Enterprise - Delay	101	Frame Relay	Over CIR In	Warning	15	60	TOT	bandwidthIn	above	150					
1008	Frame Relay for the Enterprise - Delay	101	Frame Relay	Over CIR Out	Warning	15	60	TOT	bandwidthOut	above	150					
1008	Frame Relay for the Enterprise - Delay	101	Frame Relay	Too many discard eligible frames received	Minor	15	60	TOT	deFramesInPct	above	5					
1027	Frame Relay for the Enterprise - Failure	101	Frame Relay	Frame Relay Circuit Down	Critical		30	AVAIL	availability							
1027	Frame Relay for the Enterprise - Failure	101	Frame Relay	Too many errors	Major	15	60	TOT	errorsPct	above	0.5					
1009	Frame Relay for the Service Provider - Delay	101	Frame Relay	Backward congestion received from downstream	Minor	15	60	TOT	becnIn	above	2					
1009	Frame Relay for the Service Provider - Delay	101	Frame Relay	Backward congestion sent upstream to sender	Minor	15	60	TOT	becnOut	above	2					
1009	Frame Relay for the Service Provider - Delay	101	Frame Relay	Forward congestion received from upstream	Minor	15	60	TOT	fecnIn	above	2					
1009	Frame Relay for the Service Provider - Delay	101	Frame Relay	Forward congestion sent downstream to receiver	Minor	15	60	TOT	fecnOut	above	2					
1009	Frame Relay for the Service Provider - Delay	101	Frame Relay	Over Utilized In	Minor	15	60	TOT	bandwidthIn	above	100					
1009	Frame Relay for the Service Provider - Delay	101	Frame Relay	Over Utilized Out	Minor	15	60	TOT	bandwidthOut	above	100					
1009	Frame Relay for the Service Provider - Delay	101	Frame Relay	Too many discards	Minor	15	60	TOT	discardsPct	above	1					
1028	Frame Relay for the Service Provider - Failure	101	Frame Relay	Frame Relay Circuit Down	Critical		30	AVAIL	availability							
1028	Frame Relay for the Service Provider - Failure	101	Frame Relay	Too many errors	Major	15	60	TOT	errorsPct	above	0.6					
1036	Host - Latency 2 second limit	200	Router	Latency to host too high	Minor	15	60	TOT	latency	above	2000					
1036	Host - Latency 2 second limit	201	Router	Latency to host too high	Minor	15	60	TOT	latency	above	2000					
1036	Host - Latency 2 second limit	300	Generic Server	Latency to host too high	Minor	15	60	TOT	latency	above	2000					
1036	Host - Latency 2 second limit	301	Managewise Server	Latency to host too high	Minor	15	60	TOT	latency	above	2000					
1036	Host - Latency 2 second limit	302	Insight Manager Server	Latency to host too high	Minor	15	60	TOT	latency	above	2000					
1036	Host - Latency 2 second limit	303	BMC NT Server	Latency to host too high	Minor	15	60	TOT	latency	above	2000					
1036	Host - Latency 2 second limit	304	BMC Unix Server	Latency to host too high	Minor	15	60	TOT	latency	above	2000					
1036	Host - Latency 2 second limit	305	Empire NT Server	Latency to host too high	Minor	15	60	TOT	latency	above	2000					
1036	Host - Latency 2 second limit	306	Empire Unix Server	Latency to host too high	Minor	15	60	TOT	latency	above	2000					
1036	Host - Latency 2 second limit	725	RAS	Latency to host too high	Minor	15	60	TOT	latency	above	2000					
1007	Host - Unusual Latency	200	Router	Latency to host unusually high	Minor	15	60	UV	latency	above	97.7					
1007	Host - Unusual Latency	201	Router	Latency to host unusually high	Minor	15	60	UV	latency	above	97.7					
1007	Host - Unusual Latency	300	Generic Server	Latency to host unusually high	Minor	15	60	UV	latency	above	97.7					
1007	Host - Unusual Latency	301	Managewise Server	Latency to host unusually high	Minor	15	60	UV	latency	above	97.7					
1007	Host - Unusual Latency	302	Insight Manager Server	Latency to host unusually high	Minor	15	60	UV	latency	above	97.7					
1007	Host - Unusual Latency	303	BMC NT Server	Latency to host unusually high	Minor	15	60	UV	latency	above	97.7					
1007	Host - Unusual Latency	304	BMC Unix Server	Latency to host unusually high	Minor	15	60	UV	latency	above	97.7					
1007	Host - Unusual Latency	305	Empire NT Server	Latency to host unusually high	Minor	15	60	UV	latency	above	97.7					
1007	Host - Unusual Latency	306	Empire Unix Server	Latency to host unusually high	Minor	15	60	UV	latency	above	97.7					
1007	Host - Unusual Latency	725	RAS	Latency to host unusually high	Minor	15	60	UV	latency	above	97.7					
1011	Remote Access - Delay	725	RAS	Modems over used	Minor	15	60	TOT	modemsBusyPct	above	95					
1011	Remote Access - Delay	725	RAS	Too many discards on dial-in connections	Minor	15	60	TOT	discardedFramesPct	above	5					
1011	Remote Access - Delay	750	RAS CPU	CPU too busy	Minor	15	60	TOT	cpuUtilization	above	60					
1011	Remote Access - Delay	775	Modem Pool	Modems over used	Minor	15	60	TOT	modemsBusyPct	above	95					
1030	Remote Access - Failure	725	RAS	Free memory too low	Major	5	60	TOT	memoryFree	below	2000000					
1030	Remote Access - Failure	725	RAS	Remote Access Server Down	Critical		30	AVAIL	availability							
1030	Remote Access - Failure	725	RAS	Remote Access Server Unreachable	Critical		30	REACH	reachability							
1030	Remote Access - Failure	725	RAS	Too many frame errors on dial-in	Major	15	60	TOT	frameErrorsPct	above	1					
1030	Remote Access - Failure	725	RAS	Too many modem errors	Major	15	60	TOT	modemErrors	above	0.01					
1030	Remote Access - Failure	725	RAS	Too many modem retrains	Major	15	60	TOT	retrains	above	0.05					
1047	Remote Access - Unusual Workload	725	RAS	Unusually high bits in	Warning	15	60	UV	bitsIn	above	99.9	1	TOT	connectTime	above	25
1047	Remote Access - Unusual Workload	725	RAS	Unusually high bits out	Warning	15	60	UV	bitsOut	above	99.9	1	TOT	connectTime	above	25
1047	Remote Access - Unusual Workload	725	RAS	Unusually high connect time %	Warning	15	60	UV	connectTime	above	99	1	TOT	connectTime	above	25
1047	Remote Access - Unusual Workload	725	RAS	Unusually high connections	Warning	15	60	UV	connections	above	99	1	DP	connections	above	50
1047	Remote Access - Unusual Workload	725	RAS	Unusually high memory utilization	Warning	15	60	UV	memoryUsed	above	99	1	DP	memoryUsed	above	10
1047	Remote Access - Unusual Workload	725	RAS	Unusually low connect time %	Warning	15	60	UV	connectTime	below	99	1	DP	connectTime	below	60
1047	Remote Access - Unusual Workload	725	RAS	Unusually low memory utilization	Warning	15	60	UV	memoryUsed	below	99	1	DP	memoryUsed	below	10
1047	Remote Access - Unusual Workload	750	RAS CPU	Unusually high CPU utilization	Warning	15	60	UV	cpuUtilization	above	99	1	TOT	cpuUtilization	above	25
1047	Remote Access - Unusual Workload	750	RAS CPU	Unusually low CPU utilization	Warning	15	60	UV	cpuUtilization	below	99	1	DP	cpuUtilization	below	25
1047	Remote Access - Unusual Workload	775	Modem Pool	Unusually high connect time %	Warning	15	60	UV	connectTime	above	99	1	TOT	connectTime	above	25
1047	Remote Access - Unusual Workload	775	Modem Pool	Unusually low connect time %	Warning	15	60	UV	connectTime	below	99	1	DP	connectTime	below	50
1012	Response - Delay	800	Response Path	Decreased minimum response - possible route change	Warning	60	120	DP	minResponse	below	20	1	UV	minResponse	below	95
1012	Response - Delay	800	Response Path	Destination unreachable	Major	5	60	TOT	failedAttempts	above	99.99					
1012	Response - Delay	800	Response Path	Increased minimum response - possible route change	Warning	60	120	DP	minResponse	above	20	1	UV	minResponse	above	95
1012	Response - Delay	800	Response Path	No attempts made	Major	15	60	TOT	attempts	below	0.001					
1012	Response - Delay	800	Response Path	Response over limit	Minor	15	60	TOT	responseVsGoal	above	100					
1012	Response - Delay	800	Response Path	Test attempts or transactions failed	Minor	15	60	TOT	failedAttempts	above	20					
1012	Response - Delay	800	Response Path	Unusually slow response	Minor	15	60	UV	avgRespTime	above	95					
1012	Response - Delay	801	Response Path w/ Jitter	Decreased minimum response - possible route change	Warning	60	120	DP	minResponse	below	20	1	UV	minResponse	below	95
1012	Response - Delay	801	Response Path w/ Jitter	Destination unreachable	Major	5	60	TOT	failedAttempts	above	99.99					
1012	Response - Delay	801	Response Path w/ Jitter	Increased minimum response - possible route change	Warning	60	120	DP	minResponse	above	20	1	UV	minResponse	above	95
1012	Response - Delay	801	Response Path w/ Jitter	No attempts made	Major	15	60	TOT	attempts	below	0.001					
1012	Response - Delay	801	Response Path w/ Jitter	Response over limit	Major	15	60	TOT	responseVsGoal	above	100					
1012	Response - Delay	801	Response Path w/ Jitter	Test attempts or transactions failed	Major	15	60	TOT	failedAttempts	above	20					
1012	Response - Delay	801	Response Path w/ Jitter	Too much jitter	Major	15	60	TOT	jitter	above	10					
1012	Response - Delay	801	Response Path w/ Jitter	Unusually slow response	Major	15	60	UV	avgRespTime	above	95					

Appendix B

Appendix B

Profile ID	Profile Name	Type ID	Element Type	Description	Severity	Window	duration	Rule	Variable	Direction	Threshold	AND	Rule	Variable	Direction	Threshold
1017	Server - Delay	304	BMC Unix Server	Paging too high	Minor	15	60	TOT	pagesPagedIn	above	10					
1017	Server - Delay	305	Empire NT Server	Available memory too low	Minor	5	30	TOT	physicalMemoryFree	below	4000000					
1017	Server - Delay	305	Empire NT Server	CPUs imbalanced	Minor	15	60	TOT	cpuImbalance	above	10					
1017	Server - Delay	305	Empire NT Server	CPUs too busy	Minor	15	60	TOT	avgCpuUtilization	above	90					
1017	Server - Delay	305	Empire NT Server	Paging too high	Minor	15	60	TOT	pagesPagedIn	above	10					
1017	Server - Delay	306	Empire Unix Server	CPUs imbalanced	Minor	15	60	TOT	cpuImbalance	above	10					
1017	Server - Delay	306	Empire Unix Server	CPUs too busy	Minor	15	60	TOT	avgCpuUtilization	above	50					
1017	Server - Delay	306	Empire Unix Server	Load average too high	Minor	15	60	TOT	loadAverage	above	2					
1017	Server - Delay	306	Empire Unix Server	Page scanning	Minor	15	60	TOT	pageScanRate	above	200					
1017	Server - Delay	370	Server Disk	Disk queue too long	Minor	15	60	TOT	diskQueueLength	above	2					
1017	Server - Delay	370	Server Disk	Disk too busy	Minor	15	60	TOT	diskBusyTime	above	50					
1017	Server - Delay	502	Server LAN	Collisions too high	Minor	15	60	TOT	collisionsOutPct	above	15					
1017	Server - Delay	502	Server LAN	Over Utilized	Major	15	60	TOT	bandwidth	above	60					
1017	Server - Delay	502	Server LAN	Too many discards	Major	15	60	TOT	discardsOutPct	above	1					
1017	Server - Delay	504	Server LAN Full Duplex	Over Utilized In	Major	15	60	TOT	bandwidthIn	above	90					
1017	Server - Delay	504	Server LAN Full Duplex	Over Utilized Out	Major	15	60	TOT	bandwidthOut	above	90					
1017	Server - Delay	504	Server LAN Full Duplex	Too many discards	Major	15	60	TOT	discardsOutPct	above	1					
1017	Server - Delay	600	Server WAN	Over Utilized In	Minor	15	60	TOT	bandwidthIn	above	75					
1017	Server - Delay	600	Server WAN	Over Utilized Out	Minor	15	60	TOT	bandwidthOut	above	75					
1017	Server - Delay	600	Server WAN	Too many discards	Minor	15	60	TOT	discardsOutPct	above	1					
1017	Server - Delay	3101	NT Process Set	Page Faults too high	Minor	15	60	TOT	totalPageFaults	above	25					
1032	Server - Failure	300	Generic Server	Server Down	Critical		30	AVAIL	availability							
1032	Server - Failure	300	Generic Server	Server Unreachable	Critical		30	REACH	reachability							
1032	Server - Failure	300	Generic Server	Virtual memory usage too high	Major	15	60	TOT	virtualMemoryUtilization	above	90					
1032	Server - Failure	301	Managewise Server	Server Down	Critical		30	AVAIL	availability							
1032	Server - Failure	301	Managewise Server	Server Unreachable	Critical		30	REACH	reachability							
1032	Server - Failure	302	Insight Manager Server	Server Down	Critical		30	AVAIL	availability							
1032	Server - Failure	302	Insight Manager Server	Server Unreachable	Critical		30	REACH	reachability							
1032	Server - Failure	303	BMC NT Server	Server Down	Critical		30	AVAIL	availability							
1032	Server - Failure	303	BMC NT Server	Server Unreachable	Critical		30	REACH	reachability							
1032	Server - Failure	304	BMC Unix Server	Server Down	Critical		30	AVAIL	availability							
1032	Server - Failure	304	BMC Unix Server	Server Unreachable	Critical		30	REACH	reachability							
1032	Server - Failure	304	BMC Unix Server	Swap space usage too high	Major	15	60	TOT	virtualMemoryUtilization	above	90					
1032	Server - Failure	305	Empire NT Server	Paging file usage too high	Major	15	60	TOT	virtualMemoryUtilization	above	90					
1032	Server - Failure	305	Empire NT Server	Server Down	Critical		30	AVAIL	availability							
1032	Server - Failure	305	Empire NT Server	Server Unreachable	Critical		30	REACH	reachability							
1032	Server - Failure	306	Empire Unix Server	Server Down	Critical		30	AVAIL	availability							
1032	Server - Failure	306	Empire Unix Server	Server Unreachable	Critical		30	REACH	reachability							
1032	Server - Failure	306	Empire Unix Server	Swap space usage too high	Major	15	60	TOT	virtualMemoryUtilization	above	90					
1032	Server - Failure	350	User Partition	File allocation failures	Major	5	60	TOT	partitionAllocationFailures	above	0					
1032	Server - Failure	350	User Partition	Partition nearly full	Major	6	60	DT	partitionUtilization	above	99.99					
1032	Server - Failure	350	User Partition	Running out of inodes	Major	5	60	TOT	inodeUtilization	above	95					
1032	Server - Failure	352	BMC NT Partition	Partition nearly full	Major	5	60	DT	partitionUtilization	above	99.99					
1032	Server - Failure	353	BMC Unix Partition	Partition nearly full	Major	5	60	DT	partitionUtilization	above	99.99					
1032	Server - Failure	504	Server LAN	Misconfigured - collisions on Full Duplex Ethernet Port	Major	1	60	TOT	collisionsOutPct	above	0					
1032	Server - Failure	3000	System Partition	File creation failures	Major	5	60	TOT	partitionAllocationFailures	above	1					
1032	Server - Failure	3000	System Partition	Partition nearly full	Major	5	60	DT	partitionUtilization	above	99.99					
1032	Server - Failure	3000	System Partition	Running out of inodes	Major	5	60	TOT	inodeUtilization	above	95					
1032	Server - Failure	3001	BMC NT System Partition	Partition nearly full	Major	5	60	DT	partitionUtilization	above	99.99					
1032	Server - Failure	3002	BMC Unix System Partition	Partition nearly full	Major	6	60	DT	partitionUtilization	above	99.99					
1032	Server - Failure	3100	Unix Process Set	Process Set Down	Critical		30	AVAIL	availability							
1032	Server - Failure	3101	NT Process Set	Process Set Down	Critical		30	AVAIL	availability							
1051	Server - Unusual Workload	305	Empire NT Server	Unusually high number of processes	Warning	15	60	UV	processes	above	99.9	1	DP	processes	above	10
1051	Server - Unusual Workload	305	Empire NT Server	Unusually low number of processes	Warning	15	60	UV	processes	below	99.9	1	DP	processes	below	10
1051	Server - Unusual Workload	308	Empire Unix Server	Unusually high number of processes	Warning	15	60	UV	processes	above	99.9	1	DP	processes	above	10
1051	Server - Unusual Workload	306	Empire Unix Server	Unusually low number of processes	Warning	15	60	UV	processes	below	99.9	1	DP	processes	below	10
1051	Server - Unusual Workload	330	Server CPU	Persistent Unusually high CPU system (kernel) time	Warning	60	240	UV	cpuSystemUtilization	above	99	1	DP	cpuSystemUtilization	above	50
1051	Server - Unusual Workload	330	Server CPU	Persistent Unusually high IO wait time	Warning	60	240	UV	cpuWaitUtilization	above	99	1	DP	cpuWaitUtilization	above	60
1051	Server - Unusual Workload	330	Server CPU	Unusually high CPU system (kernel) time	Warning	15	60	UV	cpuSystemUtilization	above	99	1	DP	cpuSystemUtilization	above	50
1051	Server - Unusual Workload	330	Server CPU	Unusually high CPU Utilization	Warning	15	60	UV	cpuUtilization	above	99	1	TOT	cpuUtilization	above	25
1051	Server - Unusual Workload	330	Server CPU	Unusually high IO wait time	Warning	15	60	UV	cpuWaitUtilization	above	99	1	DP	cpuWaitUtilization	above	60
1051	Server - Unusual Workload	370	Disk	Unusually high disk reads	Warning	15	60	UV	diskReads	above	99.9	1	TOT	diskReads	above	20
1051	Server - Unusual Workload	370	Disk	Unusually high disk writes	Warning	15	60	UV	diskWrites	above	99.9	1	TOT	diskWrites	above	10
1051	Server - Unusual Workload	370	Disk	Unusually long disk transfer time	Warning	15	60	UV	diskAvgTransferTime	above	99.9	1	DP	diskAvgTransferTime	above	25
1051	Server - Unusual Workload	370	Disk	Unusually short transfer time	Warning	15	60	UV	diskAvgTransferTime	below	99.9	1	TOT	diskReadsWrites	above	20
1051	Server - Unusual Workload	371	Disk BMC Server	Unusually high disk accesses	Warning	15	60	UV	diskReadsWrites	above	99.9	1	TOT	diskReadsWrites	above	20
1050	Server - Unusual Workload	502	Server LAN	Unusually high frames in	Warning	15	60	UV	framesIn	above	99.9	1	TOT	bandwidthIn	above	10
1050	Server - Unusual Workload	502	Server LAN	Unusually high frames out	Warning	15	60	UV	framesOut	above	99.9	1	TOT	bandwidthOut	above	10
1050	Server - Unusual Workload	502	Server LAN	Unusually high non-unicast frames in	Warning	15	60	UV	nonUnicastIn	above	99.9	1	TOT	bandwidthIn	above	10
1050	Server - Unusual Workload	502	Server LAN	Unusually high non-unicast frames out	Warning	15	60	UV	nonUnicastOut	above	99.9	1	TOT	bandwidthOut	above	10
1049	Server - Unusual Workload	504	Server LAN Full Duplex	Unusually high frames in	Warning	15	60	UV	framesIn	above	99.9	1	TOT	bandwidthIn	above	10
1049	Server - Unusual Workload	504	Server LAN Full Duplex	Unusually high frames out	Warning	15	60	UV	framesOut	above	99.9	1	TOT	bandwidthOut	above	10
1049	Server - Unusual Workload	504	Server LAN Full Duplex	Unusually high non-unicast frames in	Warning	15	60	UV	nonUnicastIn	above	99.9	1	TOT	bandwidthIn	above	10
1049	Server - Unusual Workload	504	Server LAN Full Duplex	Unusually high non-unicast frames out	Warning	15	60	UV	nonUnicastOut	above	99.9	1	TOT	bandwidthOut	above	10
1051	Server - Unusual Workload	3100	Unix Process Set	Unusually high Process Set CPU utilization	Warning	15	60	UV	cpuUtilization	above	99.9	1	TOT	cpuUtilization	above	10
1051	Server - Unusual Workload	3100	Unix Process Set	Unusually high Process Set network messages	Warning	15	60	UV	networkMessages	above	99.9	1	TOT	networkMessages	above	1
1051	Server - Unusual Workload	3100	Unix Process Set	Unusually high Process Set physical memory	Warning	15	60	UV	physicalMemoryUsed	above	99.9	1	DP	physicalMemoryUsed	above	10
1051	Server - Unusual Workload	3100	Unix Process Set	Unusually high Process Set reads	Warning	15	60	UV	diskBlockReads	above	99.9	1	TOT	diskBlockReads	above	10
1051	Server - Unusual Workload	3100	Unix Process Set	Unusually high Process Set writes	Warning	15	60	UV	diskBlockWrites	above	99.9	1	TOT	diskBlockWrites	above	5
1051	Server - Unusual Workload	3100	Unix Process Set	Unusually low Process Set CPU utilization	Warning	15	60	UV	cpuUtilization	below	99.9	1	DP	cpuUtilization	below	25
1051	Server - Unusual Workload	3100	Unix Process Set	Unusually low Process Set network messages	Warning	15	60	UV	networkMessages	below	99.9	1	DP	networkMessages	below	25

Appendix B

Appendix B

WHAT IS CLAIMED IS:

1. A method of monitoring an element in a computer network, said method comprising:

monitoring a preselected variable relating to said element;

defining a threshold for the monitored preselected variable;

establishing a sliding window in time;

repeatedly generating a time above threshold value, said time above threshold value being a measure of an amount of time during which the monitored variable exceeded the threshold during the sliding window of time;

detecting when the time above threshold value exceeds a condition window value; and

in response to detecting when the time above threshold value exceeds said condition window, generating an alarm.

2. The method of claim 1 further comprising after generating an alarm, maintaining the alarm at least as long as the time above threshold value exceeds a clear window value.

3. The method of claim 2 wherein said clear window value is equal to said condition window value.

4. The method of claim 3 further comprising:

monitoring a plurality of variables relating to said element, said preselected variable being one of said plurality of variables; and

for each of the plurality of monitored variables, defining a corresponding threshold for that other variable, wherein the time above threshold value is a measure of an amount of time during which any one or more of the monitored variables exceeded its corresponding threshold during the corresponding sliding window of time.

5. The method of claim 1 wherein the step of defining the threshold for the preselected variable comprises:

computing an average value for the preseleted variable based on values obtained for the preselected variable over a corresponding prior period;

defining an excursion amount; and

setting the threshold equal to a sum of the average value plus the excursion amount.

6. The method of claim 5 wherein the corresponding period of time is less than a day.

7. The method of claim 6 wherein the corresponding period of time is a particular hour period of a day.

8. The method of claim 6 wherein the step of computing the average comprises computing a mean value for the preselected variable using values obtained for that preselected variable for the same hour period of the same day of the week for a predetermined number of previous weeks.

9. The method of claim 5 wherein the step of defining an excursion amount comprises:

computing a standard deviation for the preselected variable based on values obtained for the preselected variable over a predetermined period of time; and

setting the excursion amount equal to K times the computed standard deviation, wherein K is a positive number.

10. The method of claim 9 wherein the step of computing the standard deviation comprises computing the standard deviation using values obtained for that preselected variable for the same hour period of the same day of the week for a predetermined number of previous weeks.

11. The method of claim 1 wherein the step of defining the threshold for the preselected variable comprises:

defining an excursion amount; and

setting the threshold equal to H less the excursion amount, where H is a positive number.

12. The method of claim 11 wherein the step of defining an excursion amount comprises:

computing a standard deviation for the preselected variable based on values obtained for the preselected variable over a predetermined period of time; and

setting the excursion amount equal to K times the computed standard deviation, wherein K is a positive number.

13. A method of monitoring an element in a computer network, said method comprising:

defining a profile for that element, said profile including a plurality of different alarm rules, each of said different alarm rules establishing an alarm test for a corresponding one or more variables;

detecting when the alarm test for any one or more of the plurality of different alarm rules is met;

repeatedly generating a time above threshold value, said time above threshold value being a measure of an amount of time during which any one or more of the alarm tests has been met during a preselected prior window of time;

detecting when the time above threshold value exceeds a condition window value; and

in response to detecting when the time above threshold value exceeds said condition window, generating an alarm.

14. The method of claim 13 further comprising after generating an exception, maintaining that exception at least as long as the time above threshold value exceeds a clear window value.

15. A method of displaying on a computer display screen historical performance of an element on a network, said method comprising:

monitoring performance of the element;

for each of the plurality of time slots, deriving a measure of performance for the element from its monitored performance;

for each of a plurality of time slots, computing an average value for the measure of performance of the element;

for each of the plurality of time slots, computing a variability for the measure of performance; and

on the computer display screen and for each of the plurality of time slots: (1) displaying a first indicator of the computed average value for that time slot; (2) a second indicator of the computed variability for that time slot; and (3) a third indicator of the derived measure of performance for that time slot.

16. A computer program stored on a computer-readable medium for causing a computer system to perform the functions of:

monitoring a preselected variable relating to an element of a computer network;

defining a threshold for the monitored preselected variable;

establishing a sliding window in time;

repeatedly generating a time above threshold value, said time above threshold value being a measure of an amount of time during which the monitored variable exceeded the threshold during the sliding window of time;

detecting when the time above threshold value exceeds a condition window value; and

in response to detecting when the time above threshold value exceeds said condition window, generating an alarm.

17. A computer program for monitoring an element in a computer network, said program stored on a computer-readable medium for causing a computer system to perform the functions of:

defining a profile for that element, said profile including a plurality of different alarm rules, each of said different alarm rules establishing an alarm test for a corresponding one or more variables;

detecting when the alarm test for any one or more of the plurality of different alarm rules is met;

repeatedly generating a time above threshold value, said time above threshold value being a measure of an amount of time during which any one or more of the alarm tests has been met during a preselected prior window of time;

detecting when the time above threshold value exceeds a condition window value; and

in response to detecting when the time above threshold value exceeds said condition window, generating an alarm.

18. A computer program for displaying on a computer display screen historical performance of an element on a network, said program stored on a computer-readable medium for causing a computer system to perform the functions of:

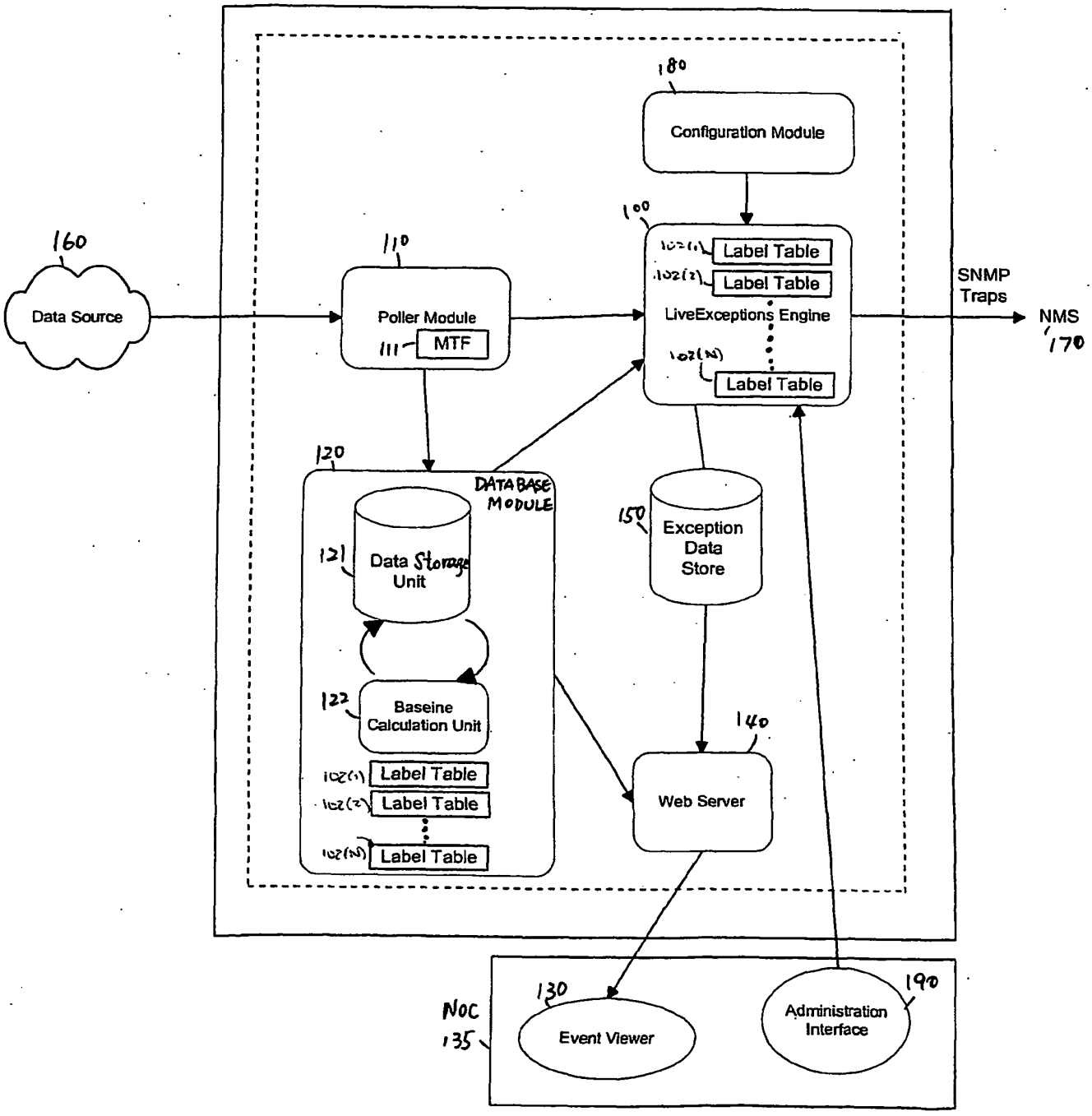
monitoring performance of the element;

for each of the plurality of time slots, deriving a measure of performance for the element from its monitored performance;

for each of a plurality of time slots, computing an average value for the measure of performance of the element;

for each of the plurality of time slots, computing a variability for the measure of performance; and

on the computer display screen and for each of the plurality of time slots: (1) displaying a first indicator of the computed average value for that time slot; (2) a second indicator of the computed variability for that time slot; and (3) a third indicator of the derived measure of performance for that time slot.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MTF
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Label Table
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SNMP Traps
NMS
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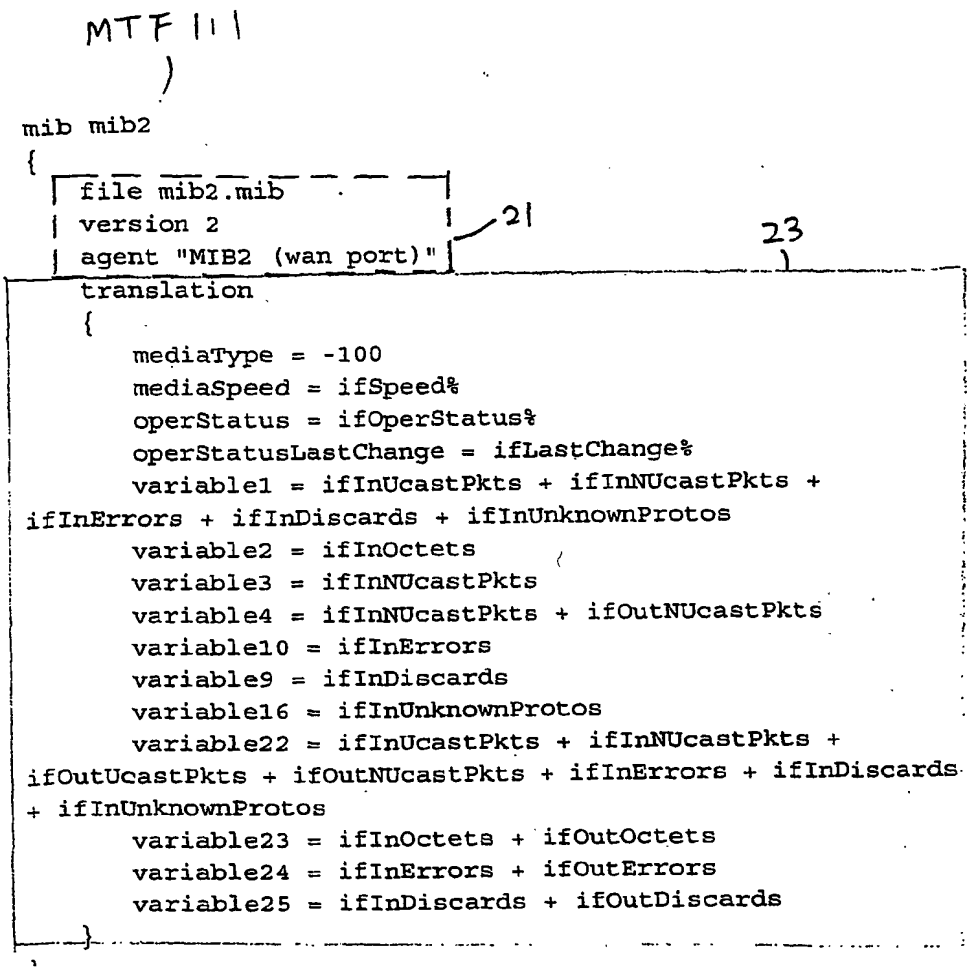
120
DATA BASE MODULE
121
Data Storage Unit
122
Baseine Calculation Unit
Label Table
Label Table
Label Table
150
Exception Data Store
140
Web Server
NOC
135
130
Event Viewer
190
Administration Interface

Fig. 1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operStatus = ifOperStatus%
operStatusLastChange = ifLastChange%
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variable2 = ifInOctets
variable3 = ifInNUcastPkts
variable4 = ifInNUcastPkts + ifOutNUcastPkts
variable10 = ifInErrors
variable9 = ifInDiscards
variable16 = ifInUnknownProtos
variable22 = ifInUcastPkts + ifInNUcastPkts + ifOutUcastPkts + ifOutNUcastPkts + ifInErrors + ifInDiscards + ifInUnknownProtos
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variable24 = ifInErrors + ifOutErrors
variable25 = ifInDiscards + ifOutDiscards
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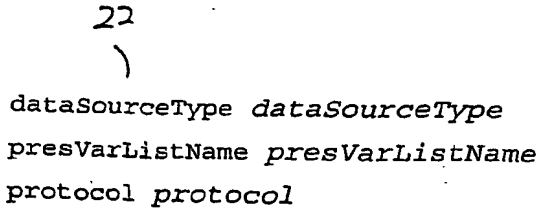
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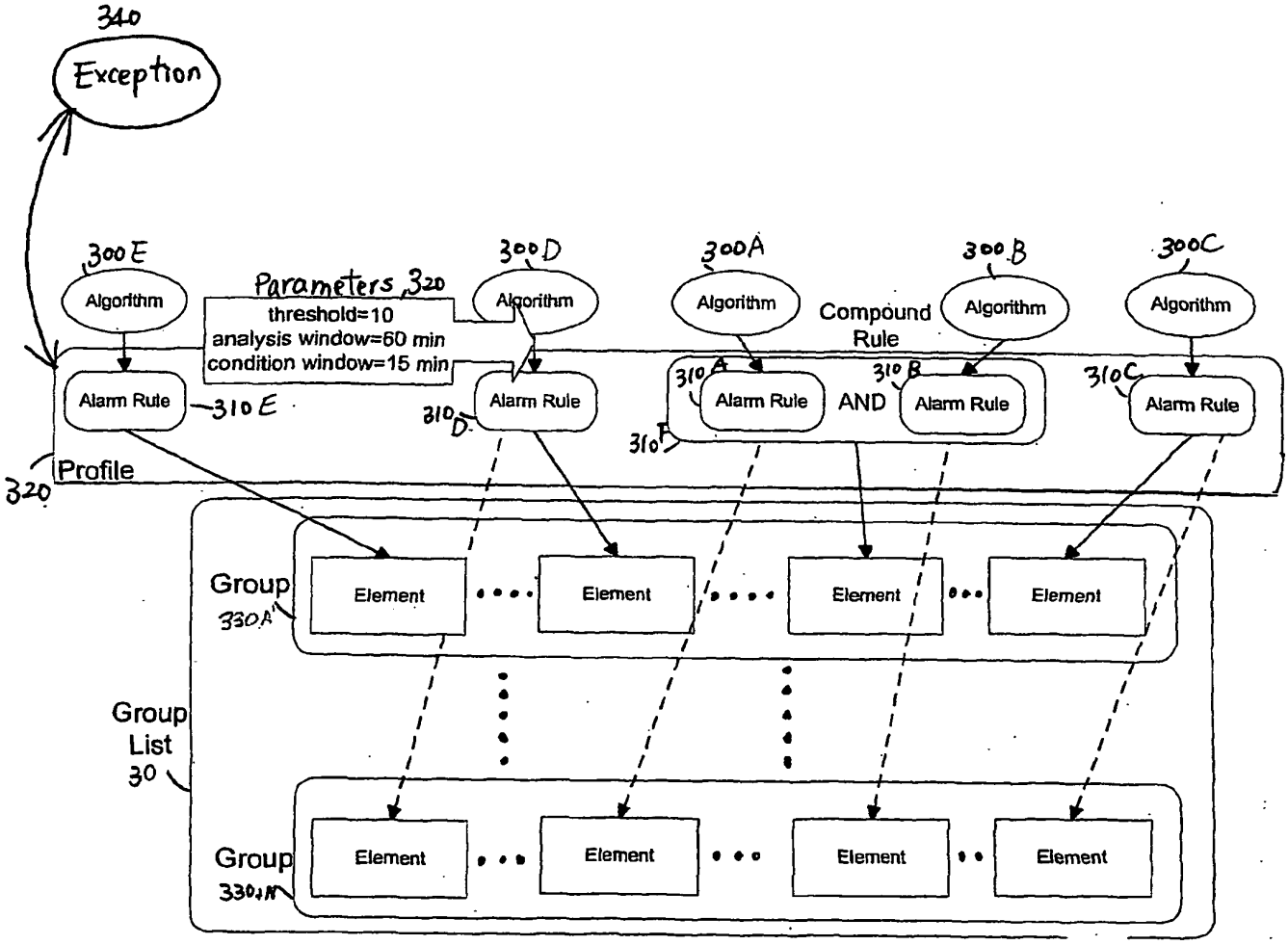
presVarListName presVarListName
protocol protocol

Fig 2.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300D
Algorithm
300A
Algorithm
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300B
Algorithm
300C
Algorithm
Alarm Rule
310E
Alarm Rule
310D
Alarm Rule
310A
Alarm Rule
AND
310B
Alarm Rule
310C
Alarm Rule
310F
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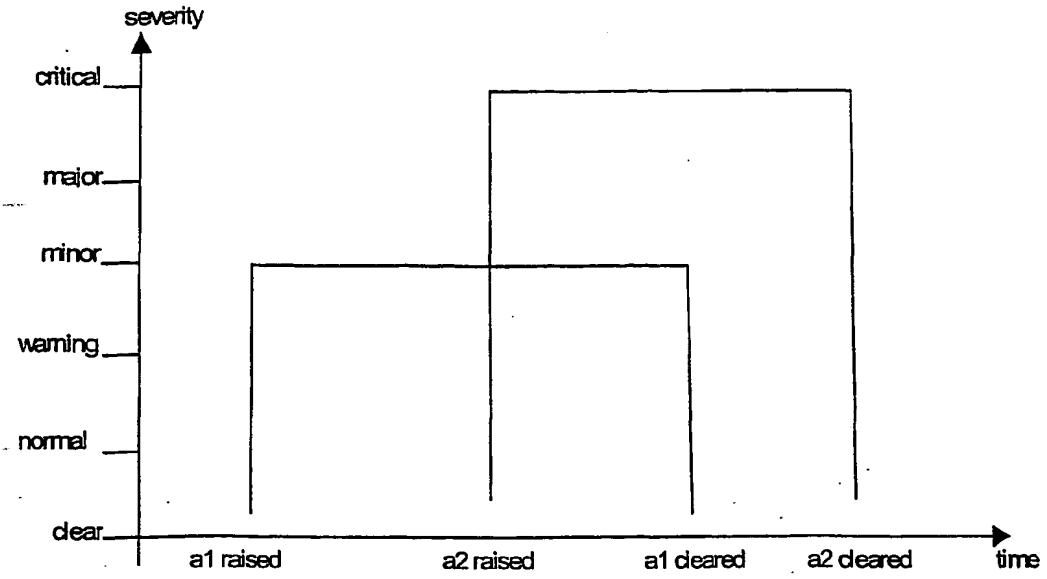
Group List
30
Group
330N
Element
Element
Element
Element

Fig 3.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critical
major
minor
warning
normal
clear
a1 raised
a2 raised
a1 cleared
a2 cleared
time

FIG. 4

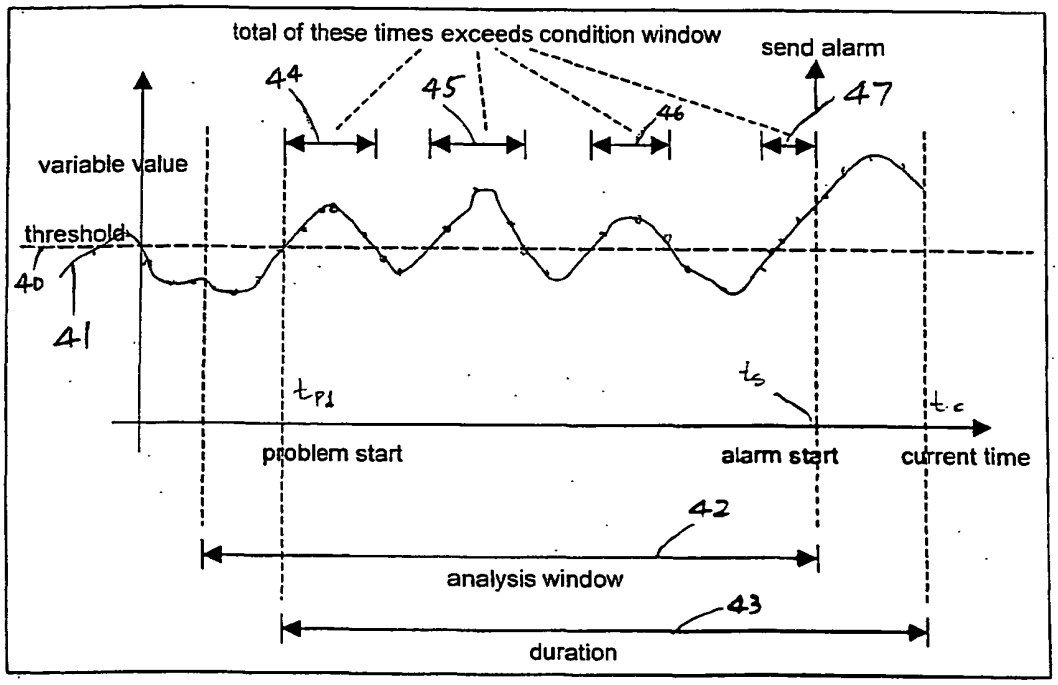
total of these times exceeds condition window
send alarm
44
45
46
47
variable value
threshold
40
41
t_{P1}
t_s
t_c
problem start
alarm start
current time
42
analysis window
43
duration

FIG.5

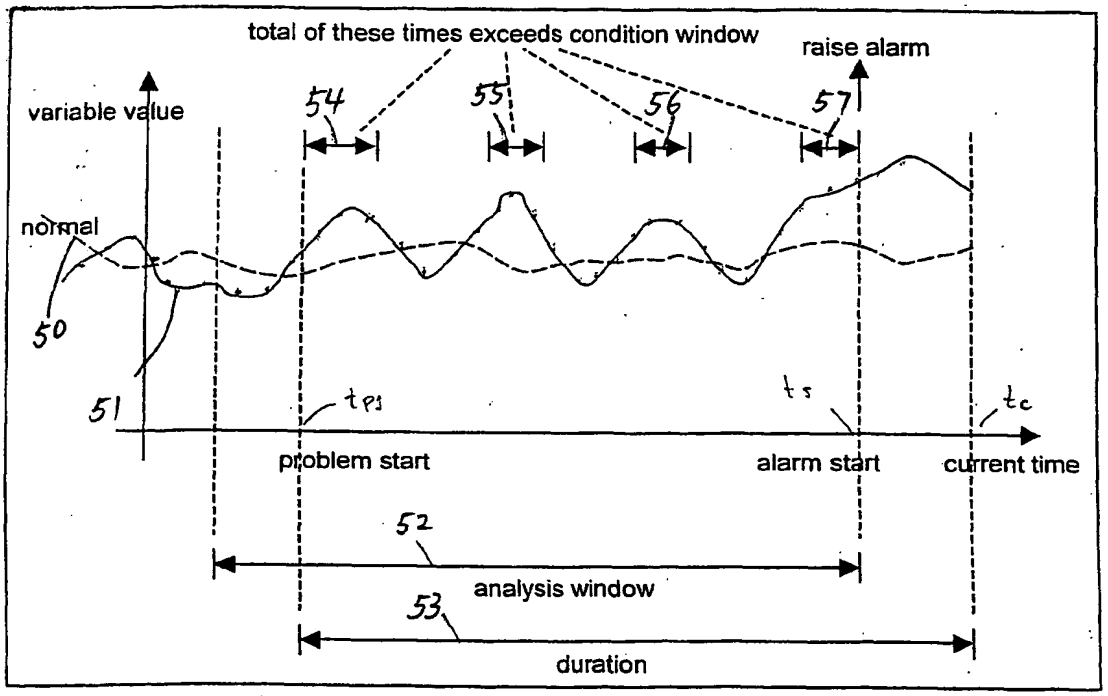
total of these times exceeds condition window
raise alarm
variable value
54
55
56
57
normal
50
51
t_{ps}
t_s
t_c
problem start
alarm start
current time
52
analysis window
53
duration

FIG. 6

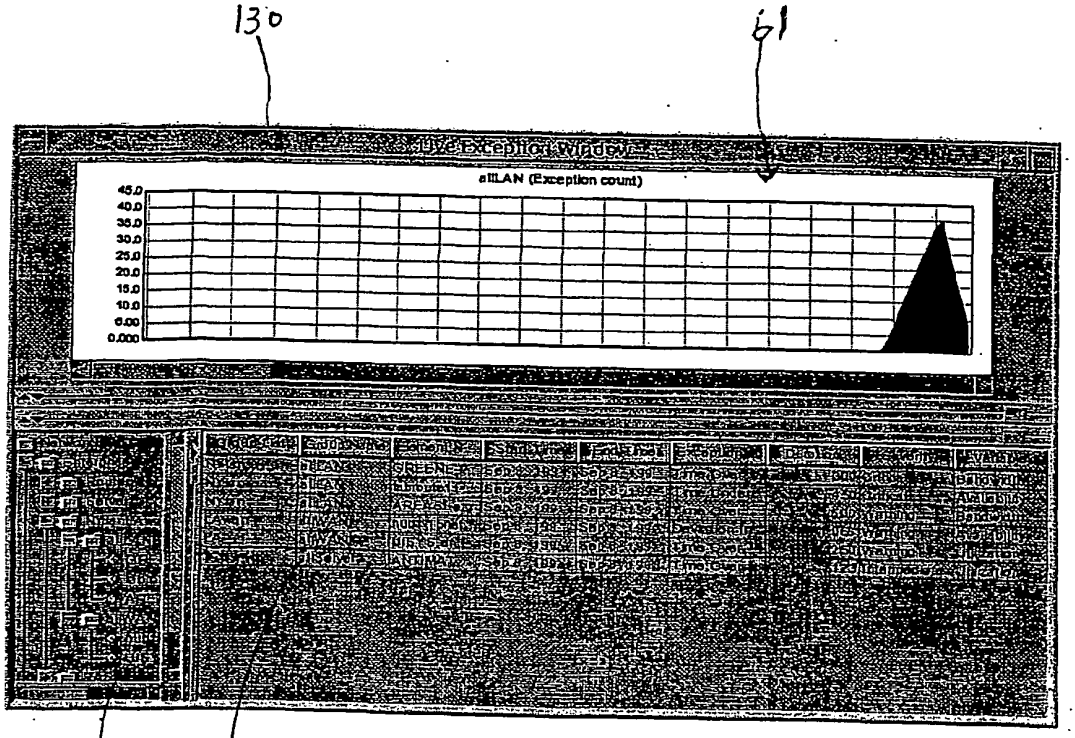
130
61
Live Exception Window
allLAN (Exception count)
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.00
0.000
63
62

Fig. 7

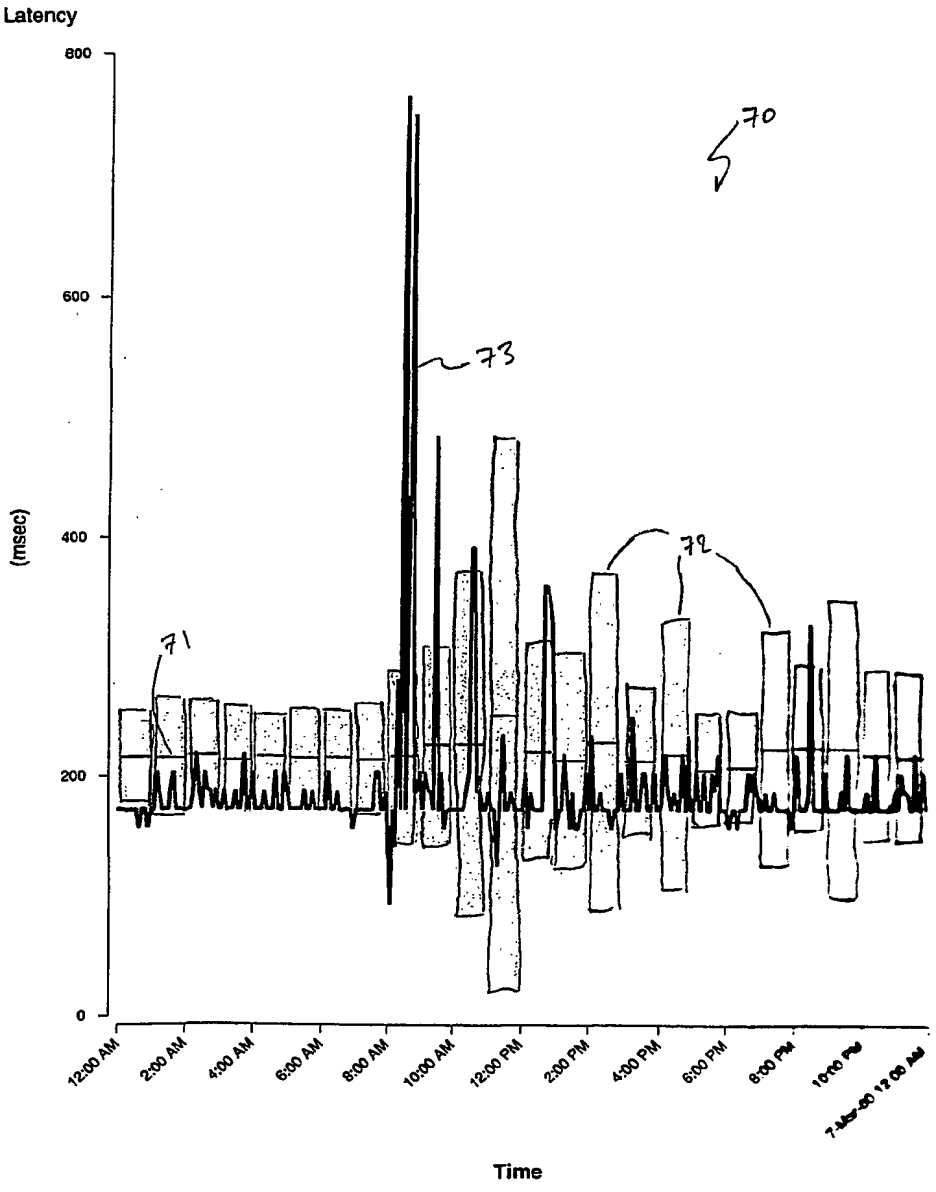
Latency
800
600
400
200
0
(msec)
70
71
72
73
12:00 AM
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
Time

FIG.8

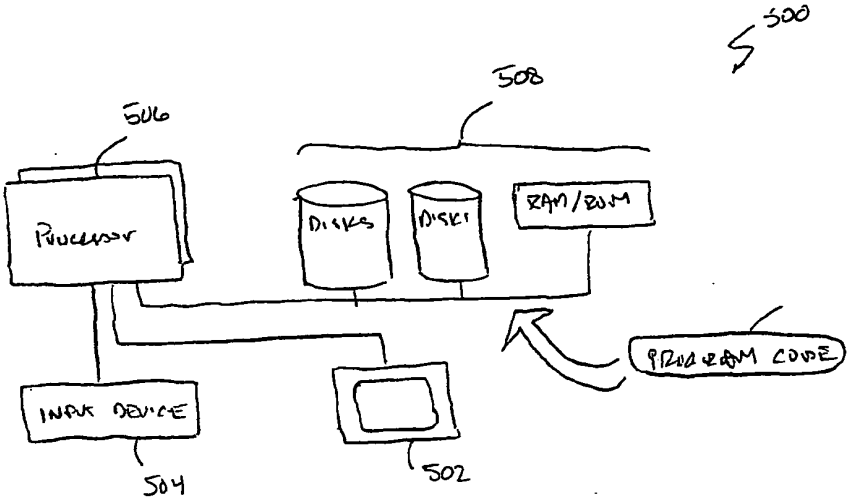
500
508
506
PROCESSOR
DISKS
DISKS
RAM/ROM
PROGRAM CODE
INPUT DEVICE
504
502

FIG. 9

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/19780

A. CLASSIFICATION OF SUBJECT MATTER
IPC(7) : G06F 15/16
US CL : 709/224
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 709/224

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
west

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,	US 6,021,437 A (CHEN et al) 1 February 2000, col. 8, lines 54-57,	1-18
X, P	US 6,081,840 A (ZHAO) 27 June 2000, col. 3, lines 11-15	1-18

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 27 AUGUST 2001	Date of mailing of the international search report 13 SEP 2001
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer DAVID Y. ENG Telephone No. (703) 305-9691

Form PCT/ISA/210 (second sheet) (July 1998) ★